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August 13, 2008

Mr. J. I. Palmer, Jr.  
U.S. EPA, Region 4  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, GA 30303-8960

Re: Annual Air Network Monitoring Plan for 2009

Dear Mr. Palmer:

In accordance with the requirements of 40 CFR Part 58.10, the South Carolina Department of Health and Environmental Control (Department) respectfully submits the Annual Air Network Monitoring Plan for calendar year 2009. The Department is required by 40 CFR Part 58.10 to adopt and submit to the Regional Administrator an Annual Monitoring Network Plan which provides for the establishment and maintenance of an air quality surveillance system that consists of a network of State and Local Air Monitoring Stations (SLAMS) including Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors that are part of SLAMS, NCore stations, Speciation Trends Network (STN) stations, and Special Purpose Monitor (SPM) monitoring stations. This plan is required to include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of 40 CFR 58, Appendices A, C, D and E.

The Department will begin seeking alternative sites as described in the plan while the plan is being reviewed by your office. The Department requests that this plan be reviewed and approved as expeditiously as possible.

A complete package, including the Annual Air Network Monitoring Plan, the Department's responses to comments received, and a complete copy of the comments the Department received from stakeholders, is being sent to Doug Neeley of your office. Should you have any questions or need additional information regarding this matter, please contact Robert Brown, Director, Division of Air Planning, Development and Outreach at (803) 898-4105.

Sincerely,

Robert W. King, Jr., P.E.  
Deputy Commissioner  
Environmental Quality Control

cc: Darren Palmer, US EPA Region 4 (w/attachments)  
Doug Neeley, US EPA Region 4 (w/attachments)  
Beverly Bannister, US EPA Region 4 (w/o attachments)  
Myra Reece, BAQ (w/o attachments)  
Robert Brown, BAQ (w/o attachments)

# Bureau of Air Quality

South Carolina Department of Health and Environmental Control

## State of South Carolina: Network Description and Ambient Air Network Monitoring Plan

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# Calendar Year 2009

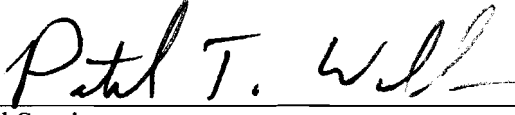


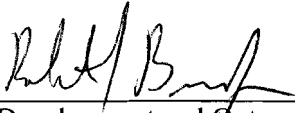
South Carolina Department of Health  
and Environmental Control

## CERTIFICATION

This document contains the planned changes and final description of the sites and monitors of the South Carolina Ambient Air Monitoring Network for criteria pollutants and related parameters for calendar year 2009. The South Carolina Department of Health and Environmental Control (DHEC) certifies that the network described herein meets or exceeds the minimum requirements needed to support the State Implementation Plan, national air quality assessments and policy decisions as required in 40 CFR Part 58, Ambient Air Quality Surveillance, at the time of submittal to the United States Environmental Protection Agency (EPA), Region 4. Due to circumstances that may arise during the implementation of the plan in 2008 and during the 2009 monitoring year, some elements of the network may require modification. A notification of modifications will be posted on the DHEC website and provided to EPA Region 4. Where necessary, a request for approval of deviations from this plan and supporting documentation will be submitted to EPA Region 4.

Scott Reynolds      Signature:       Date: 8/15/08  
Director, Division of Air Quality Analysis, Bureau of Environmental Services  
South Carolina Department of Health and Environmental Control

Pat Walker      Signature:       Date: 8/20/08  
Chief, Bureau of Environmental Services  
South Carolina Department of Health and Environmental Control

Robert Brown      Signature:       Date: 8/14/08  
Director, Division of Planning, Development and Outreach, Bureau of Air Quality  
South Carolina Department of Health and Environmental Control

Myra C. Reece      Signature:       Date: 8/14/08  
Chief, Bureau of Air Quality  
South Carolina Department of Health and Environmental Control

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## **Acronyms**

AQCR – Air Quality Control Region  
AQI – Air Quality Index  
AQS – Air Quality System  
BAQ – Bureau of Air Quality  
BC – Black Carbon  
CAAA – Clean Air Act Amendment  
CBSA – Core-Based Statistical Area  
CFR – Code of Federal Regulation  
CSA – Combined Statistical Area  
DAQA – Division of Air Quality Analysis  
EPA – Environmental Protection Agency  
FDMS – Filter Dynamics Measurement System  
FEM – Federal Equivalent Method  
FRM – Federal Reference Method  
GC/MS – Gas Chromatography / Mass Spectroscopy  
HPLC – High Performance Liquid Chromatography  
IC – Ion Chromatography  
ICP – Inductively Coupled Plasma  
IMPROVE – Interagency Monitoring of Protected Visual Environments  
ICP/MS – Inductively Coupled Plasma Mass Spectroscopy  
LAC – Light-Absorbing Carbon  
MET - Meteorology  
MSA – Metropolitan Statistical Area  
mSA – Micropolitan Statistical Area  
NAAQS – National Ambient Air Quality Standards  
NATTS- National Air Toxics Trends Site  
NADP-MDN – National Atmospheric Deposition Program Mercury Deposition Network  
NATA – National Air Toxics Assessment  
NCore – National Core Monitoring Network  
NPAP – National Performance Audit Program  
NWS – National Weather Service  
PEP – Performance Evaluation Program  
PSD – Prevention of Significant Deterioration  
PTFE - Polytetrafluoroethylene

PUF – Polyurethane Foam  
QA – Quality Assurance  
QAPP – Quality Assurance Project Plan  
QC – Quality Control  
SAMWG – Standing Air Monitoring Working Group  
DHEC – South Carolina Department of Health and Environmental Control  
SLAMS – State and Local Air Monitoring Station  
SPM – Special Purpose Monitor  
STN – Speciation Trends Network  
TBD - To be determined  
TEOM – Tapered Element Oscillating Microbalance  
TOT – Thermal Optical Transmittance  
TSP – Total Suspended Particulate  
US EPA – US Environmental Protection Agency  
UV – Ultraviolet  
WGS84 – World Geodetic System of 1984 revised in 2004  
XRF – X-ray Fluorescence Spectroscopy

## TABLE OF CONTENTS

<b>Acronyms .....</b>	<b>ii</b>
<b>Introduction .....</b>	<b>iv</b>
<b>2009 Monitoring Network Plan: Public Participation Opportunities.....</b>	<b>v</b>
<b>Network Operation .....</b>	<b>v</b>
<b>Station Description Content .....</b>	<b>1</b>
<b>Station Description.....</b>	<b>1</b>
Site Description .....	1
Monitor Details .....	1
Changes for 2009 .....	5
<b>Network Summaries.....</b>	<b>7</b>
<b>PM<sub>2.5</sub> Samplers Suitable for comparison to the PM<sub>2.5</sub> National Ambient Air Quality Standards .....</b>	<b>8</b>
<b>PM<sub>2.5</sub> and Ozone Design Values 2005 – 2007 .....</b>	<b>9</b>
<b>Summary of 2009 Network Changes .....</b>	<b>10</b>
<b>Greenville-Spartanburg-Anderson CSA... ..</b>	<b>11</b>
Greenville County Health Department .....	13
Taylors .....	15
Greenville Employment Security Commission (ESC) .....	16
Long Creek .....	17
North Spartanburg Fire Station #2 .....	18
West View .....	19
Anderson Library .....	20
Big Creek .....	21
T.K. Gregg Recreation Center .....	22
Famoda Farms.....	23
Southeast Greenville County .....	24
<b>Columbia-Newberry CSA.....</b>	<b>25</b>
Irmo.....	26
Cayce CMS .....	28
Cayce City Hall.....	29
Olympia .....	30
Parklane .....	31
Bates House (USC).....	32
State Hospital .....	33
Congaree Bluff.....	34
Sandhill Experimental Station .....	35
<b>Charlotte-Gastonia-Salisbury CSA (part) .....</b>	<b>36</b>
York CMS.....	37
<b>Myrtle Beach-Conway-Georgetown CSA .....</b>	<b>38</b>
Georgetown CMS .....	39
Howard High School #3.....	40

Beck Administration Center .....	41
<b>Augusta-Richmond County MSA (part)...</b>	<b>42</b>
Jackson Middle School .....	43
Trenton.....	44
North Aiken County.....	45
Aiken Particulate Study .....	46
<b>Charleston-North Charleston MSA .....</b>	<b>47</b>
Bushy Park Pump Station .....	48
Jenkins Ave. Fire Station .....	49
Cape Romain.....	50
FAA .....	52
Charleston Public Works .....	53
<b>Florence MSA.....</b>	<b>54</b>
Pee Dee Experimental Station.....	55
H L Sneed Middle School.....	56
Williams Middle School .....	57
<b>Remainder of State .....</b>	<b>58</b>
Due West .....	59
Chesterfield.....	60
Ashton.....	62
<b>Monitors Discontinued for 2009 .....</b>	<b>63</b>
Cowpens .....	64
Clemson CMS.....	65

*Cover Photo: Sandhill monitoring site located in northeastern, Columbia, SC*

## Introduction

The South Carolina Department of Health and Environmental Control (Department) has operated an air quality monitoring network in South Carolina since 1959. Since that time, the network has continually evolved to meet the requirements and needs of the Department's Air Program. In 2007 the network was comprised of 96 monitors and samplers at 41 sites.

In October, 2006, the United States Environmental Protection Agency (EPA) published revisions to the ambient monitoring regulations (71 FR 61236, October 17, 2006) requiring quality assurance, monitor designations, minimum requirements for both number and distribution of monitors among metropolitan statistical areas (MSAs), and probe siting changes. The regulation also specified the requirement for an annual monitoring network plan and periodic network assessment.

Monitor designations include the State and Local Air Monitoring Station (SLAMS), special purpose monitoring (SPM) and the National Core Monitoring Network (NCore). The SLAMS air monitoring network is specific for the criteria pollutants, those pollutants for which National Ambient Air Quality Standards (NAAQS) have been established. In addition to a SLAMS network, the air monitoring network includes special purpose monitors (SPM) for air toxics, particulate, mercury, criteria pollutants, precipitation and meteorology. The NCore network is designed to track long term trends for accountability of emissions control programs and health assessments that contribute to ongoing reviews of the NAAQS; support development of emissions control strategies through air quality model evaluation and other observations. The NCore network is required to measure ozone (O<sub>3</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), total reactive nitrogen, particulate matter 2.5 (PM<sub>2.5</sub>)(both continuous and Federal Reference Method), PM<sub>2.5</sub> chemical speciation; coarse particulate matter (PM<sub>10-2.5</sub>)(with a continuous Federal Equivalent Method); including temperature, wind speed, wind direction, and relative humidity.

This plan covers the eighteen month period from July 1, 2008 through December 31, 2009. This

period includes a 6 month implementation period during which sites indicated as 'new' will be identified, secured and prepared for the installation of monitoring equipment. It is expected that any monitoring indicated as 'New' or 'to be established' will be installed, calibrated and operating in 2009 with the exception of some Ozone monitors which may begin operation at the start of the South Carolina Ozone Monitoring Season (April-October). Stakeholder groups have committed to assist in identifying and securing access to suitable locations. These efforts will continue in this and in subsequent monitoring plans as the Department continues to identify new monitoring needs.

The annual monitoring network plan, as required and described in 40 CFR Part 58.10, Annual Monitoring Network Plan and Periodic Network Assessment, must contain the following information for each monitoring station in the network:

- The Air Quality System (AQS) site identification number for existing stations.
- The location, including street address and geographical coordinates, for each monitoring station.
- The sampling and analysis method used for each measured parameter.
- The operating schedule for each monitor.
- Any proposal to remove or move a monitoring station within a period of eighteen months following the plan submittal.
- The monitoring objective and spatial scale of representativeness for each monitor.
- The identification of any sites that are suitable for comparison against the PM<sub>2.5</sub> NAAQS.
- The Metropolitan Statistical Area (MSA), Core-Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.

This document constitutes the South Carolina Air Monitoring Network Plan and is organized into two main parts:

**Network Summaries:** Presenting the total number of sites and monitors for the State. Also included is a listing of all proposed changes to the current network.

**Air Monitoring Station Description:** An outline of the designations, parameters, monitoring methods and the purpose for each monitor at the site.

The South Carolina Ambient Monitoring Network will be reviewed annually and planned changes will be described in this plan (and its annual revisions) and provided for public review and comment prior to submission to the EPA Region 4 Administrator.

### **2009 Monitoring Network Plan: Public Participation Opportunities**

In anticipation of the need for an updated monitoring plan, heightened public interest and potential impact of the monitoring regulation changes, the Air Program once again solicited involvement from both internal (to the Department) and external workgroups.

The internal workgroup included representatives of all areas of the Air Program (Permitting, Planning, Modeling, Compliance, Outreach, and Monitoring) and included participation of potential data users from other areas of the Agency.

An external workgroup was convened with invited representatives of the business, environmental and health communities.

Other opportunities for public involvement include:

- A web page established for publication and access to draft and reference documents and announcements<sup>1</sup>.
- Meetings with the Greenville-Spartanburg-Anderson stakeholders group.
- Meetings with a Georgetown stakeholders group.

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<sup>1</sup><http://www.scdhec.net/environment/baq/ambientairmonitoring.aspx>

- Availability of the proposed Ambient Monitoring Plan for public review and comment from June 3 to July 2, 2008. All recorded participants who registered in the outreach and discussion activities were notified when the plan became available for review.
- Meetings and conference calls with the stakeholder groups throughout the process.

The Department is committed to continuing the involvement and participation opportunities in the development of the annual revisions of the Monitoring Plan and the periodic assessments of the air quality surveillance system.

### **Network Operation**

The primary responsibility for the operation of the South Carolina Ambient Monitoring Network (Monitoring Network) is assigned to the Division of Air Quality Analysis in the Bureau of Environmental Services (Division). The Division establishes, maintains and operates the sites and instruments that make up the network and performs the analysis of samples collected as part of routine monitoring or special projects. Data generated by the network for comparison to the National Ambient Air Quality Standards (NAAQS) is verified to be accurate and reported by the Division and stored in the national Air Quality System (AQS) database.

Criteria pollutant monitoring for the purpose of comparison to the NAAQS is performed using EPA designated Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) to ensure the precision and accuracy of the measurements across the air quality surveillance system.

Regular calibration and audits of the measurement systems are performed to verify that the instruments are operating correctly and data being collected is accurate. The quality assurance activities supporting the Monitoring Network meet or exceed the quality assurance requirements defined in 40 CFR Part 58 Appendix A (Quality Assurance Requirements for SLAMS, SPMs and PSD Air Monitoring).

Raw data is collected hourly from sites across the state and provided to internal data users



(forecasters and data analysts) and to the AIRNow database for presentation to the public. Before the data is submitted to AQS it is verified to be accurate through review of the instrument Quality Control (QC) and Quality Assurance (QA) performance documentation.

Instrument QA/QC alone is not sufficient to assure monitoring data quality. For this reason, the Department, in addition to periodic site assessments, has begun conducting additional visits of monitoring sites with involvement of stakeholder groups to enable comparison with applicable siting criteria. This process will continue until all monitors have been reviewed. The Department will continue working with the stakeholder groups and other interested parties through the implementation of this and subsequent annual plans, including the 2010 Five Year Assessment. Where concerns have been raised regarding probe siting criteria, the Department will work to correct deficiencies or to identify possible new/replacement sites as appropriate.

It is the Department's intent that all criteria pollutant monitors and samplers be sited and operated consistent with the requirements of 40 CFR Part 58 and Appendices A (Quality Assurance), C (Methods), D (Network Design) and E (Probe Siting Criteria) and the data collected by these samplers and monitors is suitable for comparison to the NAAQS. The Department further intends to assure that the samplers and monitors comply with as many of the recommendations contained within the regulations and applicable guidance documents as is possible.

An element of the Quality System<sup>2</sup> employed by the Division is periodic assessments of systems and monitor performance. As the primary quality assurance organization for ambient air monitoring activities, the Division operates under the approved Environmental Quality Control Quality Assurance Management Plan, the Ambient Air Quality Monitoring Quality Assurance Project Plan and approved plans for

specific projects. EPA Region 4 provides periodic Technical Systems Audits of sampling and analytical methods, network operation, data collection and reporting and Quality Assurance activities at their discretion or at the request of the Department's Air Program. EPA Region 4 may conduct audits of any component of the operation of the network or quality management system. The Division also participates in the National Performance Audit Program (NPAP) and the Performance Evaluation Program (PEP) administered by EPA to provide independent audits of criteria pollutant monitoring and performance.

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<sup>2</sup> The Quality System is the means by which the Department implements the quality management process through the Quality Assurance Management Plan for SC DHEC, September, 1998.

## Station Description Content

Specific siting information for each site and monitor is stored in the EPA's AQS, the national ambient air database. The AQS Site Description includes the exact location of the site, local and regional population, and description of the site location, monitor types, and monitoring objectives. This site and monitor information is routinely updated whenever there is a change in site characteristics or pollutants monitored.

AQS is used as the primary repository for all South Carolina ambient monitoring data including site descriptions. All ambient monitoring data possible is stored in AQS, including non NAAQS parameters, ambient toxics, total suspended particulate and supporting quality assurance data.

### Station Description

The network station descriptions contained in this document include the following information:

#### *Site Description*

The header for each site includes:

#### **Site Name**

The **Air Quality Control Region** (AQCR) name and number- AQCRs were established as part of the Clean Air Act.

The **Core Based Statistical Areas** (CBSA) as defined by the US Census. (November 2004).<sup>3</sup>

**AQS Site ID:** The unique site identification number used in AQS in the form:

#### **45-0cc-ssss**

Where:

**45** is the state identification code for SC,

**cc** is the county identification code and

**ssss** is the site identification code within the county.

**Location:** Typically the street address of the site where available.

**County:** County in which the site is located.

**Coordinates:** Listed in decimal degrees, Latitude (N) then Longitude (W) using WGS84 projection.

**Date Established:** The date when each existing monitoring station was established is shown in the description. For new stations proposed in this plan, a date is provided when it is expected for the station to be in operation. Individual monitors at a site may have differing start and stop dates.

Date of most recent **Site Evaluation:** Each monitoring station in the network is periodically visited to determine whether all probe exposure criteria required for monitors are met. If necessary, corrective action is scheduled to correct deficiencies.

#### *Monitor Details*

In a table associated with each site the parameters monitored at that site are listed along with descriptive information associated with that parameter.

#### **Parameter**

Criteria (compounds for which a National Ambient Air Quality Standard has been established), non Criteria and/or supporting parameters (primarily meteorological measurements) measured at the site are listed.

#### **Scale**

Each monitor or sampler in the monitoring network is described in terms of the approximate physical dimensions of the air parcel nearest the monitoring station throughout which pollutant concentrations are expected to be reasonably similar. This is most often referred to as the *Scale* of the monitor. Different pollutants monitored at the same location may represent different scales depending on the characteristics of the pollutant. Area dimensions or scales of representativeness used in the network description are:

##### (a) Microscale

Air volumes associated with area dimensions ranging from several meters up to about 100 meters.

##### (b) Middle scale

Areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

<sup>3</sup> The US Census Bureau periodically adjusts CBSA names and boundaries. This plan uses the latest available revision.

(c) Neighborhood scale

Extended areas of a city that has relatively uniform land use with dimensions ranging from 0.5 to 4.0 kilometers.

(d) Urban scale

Citywide or equivalent rural areas with dimensions ranging from 4 to 50 kilometers.

(e) Regional scale

Areas ranging from 50 to hundreds of kilometers in diameter.

The true representative area may best be described by an irregular shape of the approximate dimensions indicated above accounting for local sources and differing land use.

The representative scale of a monitor is closely associated with the objective of the monitoring.

### Objective

The ambient monitoring network is designed to meet three primary objectives:

Provide air pollution data to the public in a timely manner. Near real-time data is made available on the internet through AIRNow and Air Quality Index (AQI) reporting and forecasting in the major metropolitan areas.

Support compliance with ambient air quality standards and emissions strategy development. Monitors are operated to measure concentrations for comparison to NAAQS and to provide information to aid the development of strategies to improve air quality.

Support air pollution research studies. Data from the monitoring networks support greater understanding of the impacts and effects of ambient air pollution.

Individual monitors within a monitoring network that support these basic objectives generally serve one or more of the following purposes:

- Determine highest concentrations of pollutants,
- Determine representative concentrations in areas of high population density,

- Determine impact on air quality of significant sources or source categories,
- Determine general background concentrations,
- Determine extent of regional pollutant transport, and
- Determine welfare-related impacts in more rural and remote areas (ex. visibility impairment and impacts to vegetation).

The design intent in siting stations is to correctly match the area represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the monitor. The relationship of appropriate scale to the six basic purposes are:

Monitoring Purpose	Siting Scale
Highest concentration	Micro, Middle, Neighborhood
Population	Neighborhood, Urban
Source impact	Micro, Middle, Neighborhood
General/background	Neighborhood, Urban, Regional
Regional transport	Urban, Regional
Welfare-related impacts	Urban, Regional

Monitor and sampler data is regularly reviewed to assure the assigned scale is correct and appropriate for the intended objective.

### Designation

Required and long term criteria pollutant monitors described in the air quality monitoring network are designated **State and Local Air Monitoring Stations (SLAMS)**.

**SLAMS:** EPA requirements for air quality surveillance systems provide for the establishment of a network of monitoring stations designated SLAMS that measure ambient concentrations of those pollutants for which standards have been established. These stations must meet requirements that relate to four major

areas: quality assurance, monitoring methodology, sampling interval and siting of instruments and instrument probes.

Monitoring at some locations meets Air Program needs beyond that necessary for compliance with minimum requirements. **Special Purpose Monitors (SPM)** are operated to meet specific Air Program needs and may be long term or part of special studies designed to answer specific questions.

**SPM:** Monitors in the air quality surveillance network not designated SLAMS are Special Purpose Monitors. Special Purpose Monitors support investigations addressing complaints, areas and pollutants of concern, network refinement, modeling verification and compliance. These monitors are committed to investigation and projects as described in the associated Quality Assurance Project Plan (QAPP). They may be located as separate monitoring stations or be included at existing monitoring locations. Monitoring data will be reported to AQS where possible. Siting and probe exposure will conform to all requirements for SLAMS monitors whenever possible.

Both SLAMS and SPM data may be used in the reporting of an area Air Pollutant Quality Index.

**Air Quality Index (AQI):** The AQI is a method of reporting that converts concentration levels of pollution to a simple number scale of 0-500. Index reporting is required for all urban areas with a population exceeding 350,000. Intervals on the AQI scale are related to potential health effects of the daily measured concentration of the measured pollutants. All stations in a metropolitan area provide data for daily index reporting. Data collected from continuous monitors for Ozone and PM<sub>2.5</sub> monitors is collected hourly and reported as AQI maps on EPA's AIRNow website. A daily AQI is provided for the Greenville-Spartanburg, Columbia, and Charleston-North Charleston areas.

### **Probe Height**

The monitor or sampler probe is the point where ambient air enters the analytical or sample collection system. Ideally, air would be sampled at approximately nose height, but due to operational, exposure and security considerations

air may be sampled further from ground level. Proper probe height is specified in the monitoring regulations (typically between 2 and 15 meters) and is checked as part of the periodic site evaluations.

### **Analysis Methods**

All sampling and analytical procedures used for comparison of ambient concentrations of criteria pollutants to the NAAQS will use designated Federal Reference (FRM) or equivalent (FEM) methods. Where appropriate for specific monitoring objectives, well characterized non-equivalent methods may be used.

#### **• Particulate Matter 10 microns in size (PM<sub>10</sub>)**

PM<sub>10</sub> samplers operated by the Department are designated as either FRM or FEM samplers and are operated according to the requirements set forth in 40 CFR Part 50 and 40 CFR Part 58. Intermittent samplers collect a 24-hr sample no less than every sixth day on a quartz filter. The filter is conditioned and weighed before and after the sample run. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter (µg/m<sup>3</sup>). The quartz filters are equilibrated before each weighing for a minimum of 24 hours at a 20-23°C mean temperature and a 30-40% mean relative humidity.

Continuous PM<sub>10</sub> samplers provide 24-hour concentration measurements every day. During sampling, ambient air passes through an inlet designed to pass only particles smaller than 10 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the flow rate. Data is stored locally on redundant on site data acquisition systems and recovered hourly by an automated central data acquisition system.

#### **• Particulate Matter 2.5 microns in size (PM<sub>2.5</sub>)**

All PM<sub>2.5</sub> samplers operated by the Department are designated FRM samplers. Manual samplers are operated per the requirements set forth in 40 CFR Part 50, Appendix L. Samples are collected on 46.2 mm Polytetrafluoroethylene (PTFE) filters over a 24-hour sampling period. Air flow through the filter is maintained at 16.7 liters per minute. The flow rate must not vary more than +/-5% for five minutes over a 24-hour sample period at actual ambient temperature and pressure. Samples should be retrieved within 96 hours of the end of the sample run and should be kept cool (4°C or cooler) during transit to meet the thirty-day limit for final weighing.

The PTFE filters are equilibrated and weighed before and after the sample run for a minimum of 24 hours at a controlled atmosphere of 20-23°C mean temperature and 30-40% mean relative humidity. Filters are used within thirty days of initial weighing. Filters must be re-weighed within thirty days of the end of the sample run if kept at 4°C or cooler. The gain in weight in relation to the volume of air sampled is calculated in µg/m<sup>3</sup>.

Continuous PM<sub>2.5</sub> monitors provide hourly measurements for AQI reporting but do not provide concentration data currently suitable for comparison to the NAAQS. During monitoring, ambient air passes through an inlet system designed to pass only particles smaller than 2.5 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the flow rate. Data is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

#### PM<sub>2.5</sub> Speciation sampling and analysis

In addition to operating PM<sub>2.5</sub> samplers that allow measurement of only PM<sub>2.5</sub> mass concentration, the Department also operates PM<sub>2.5</sub> speciation samplers that collect samples that are analyzed to

determine the chemical makeup of PM<sub>2.5</sub>. Samples are collected on a set of three cartridges over a 24-hour sampling period. The individual cartridges contain denuders and filters designed to efficiently capture the major components of PM<sub>2.5</sub>.

After collection, the samples are shipped in ice chests to the EPA contract laboratory for analysis. At the laboratory the samples are analyzed using thermal optical analysis (for carbon), ion chromatography and x-ray fluorescence (for metals) to determine the presence and concentration of specific compounds. Sample results are stored in AQS.

#### **• Sulfur dioxide**

Instruments used to continuously monitor sulfur dioxide levels in the atmosphere employ the FEM Ultraviolet (UV) fluorescence method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of these instruments is done dynamically using EPA protocol gas mixtures containing a known concentration of sulfur dioxide in nitrogen. This gas is diluted to give varying known concentrations of sulfur dioxide. These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

#### **• Carbon Monoxide**

Continuous monitoring for carbon monoxide is performed by use of the FRM non-dispersive infrared correlation method. Data is stored locally on redundant data acquisition systems and recovered hourly by the Division automated central data acquisition system.

Calibration of the instrument is done dynamically using EPA Protocol gas mixtures containing a known concentration of carbon monoxide in air. The gas is diluted to give varying known concentrations of carbon monoxide. These known concentrations are supplied to the instrument,

which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Ozone**

Ozone is monitored using the FEM Ultraviolet (UV) photometry method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by the Division automated central data acquisition system.

Monitors are routinely calibrated using portable ozone transfer standards. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Nitrogen Dioxide**

The FRM chemiluminescence and UV methods are used in monitoring the nitrogen dioxide level in the ambient air. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of the instrument is done dynamically using EPA protocol gas mixtures containing a known concentration of nitric oxide in nitrogen. The gas is diluted to give varying known concentrations of nitric oxide. An ozone generator and converter are used to convert Nitric Oxide (NO) to Nitrogen Dioxide (NO<sub>2</sub>). These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

- **Lead**

Lead concentrations are determined from the analysis of total suspended particulate collected using high volume particulate samplers as described in 40 CFR §50 Appendix G. Particulate samples are acid extracted to dissolve the metals.

The lead content is determined using Inductively Coupled Plasma (ICP) spectrophotometry.

### **Sampling Frequency**

Measurements of the parameters related to air quality are performed using sampling and continuous monitoring. Sampling frequency is the indicator of how often a measurement is made and reported.

**Sampling** typically involves collection of a sample over a period (typically 24 hours, midnight to midnight) and delivery of the sample to the laboratory for preparation and analysis. Samples are collected every day (1:1), every third day (1:3), every sixth day (1:6) and for some projects, every twelfth day (1:12) depending on the data quality objectives necessary for the project. Results of the analysis are reported as averages for the period. The EPA publishes 1:3 and 1:6 day sampling schedules used nationwide and by the Monitoring Network.<sup>4</sup>

**Monitoring** typically uses on-site analyzers that continuously sample the air and measure the pollutant of interest. Results of the analysis are reported as hourly averages.

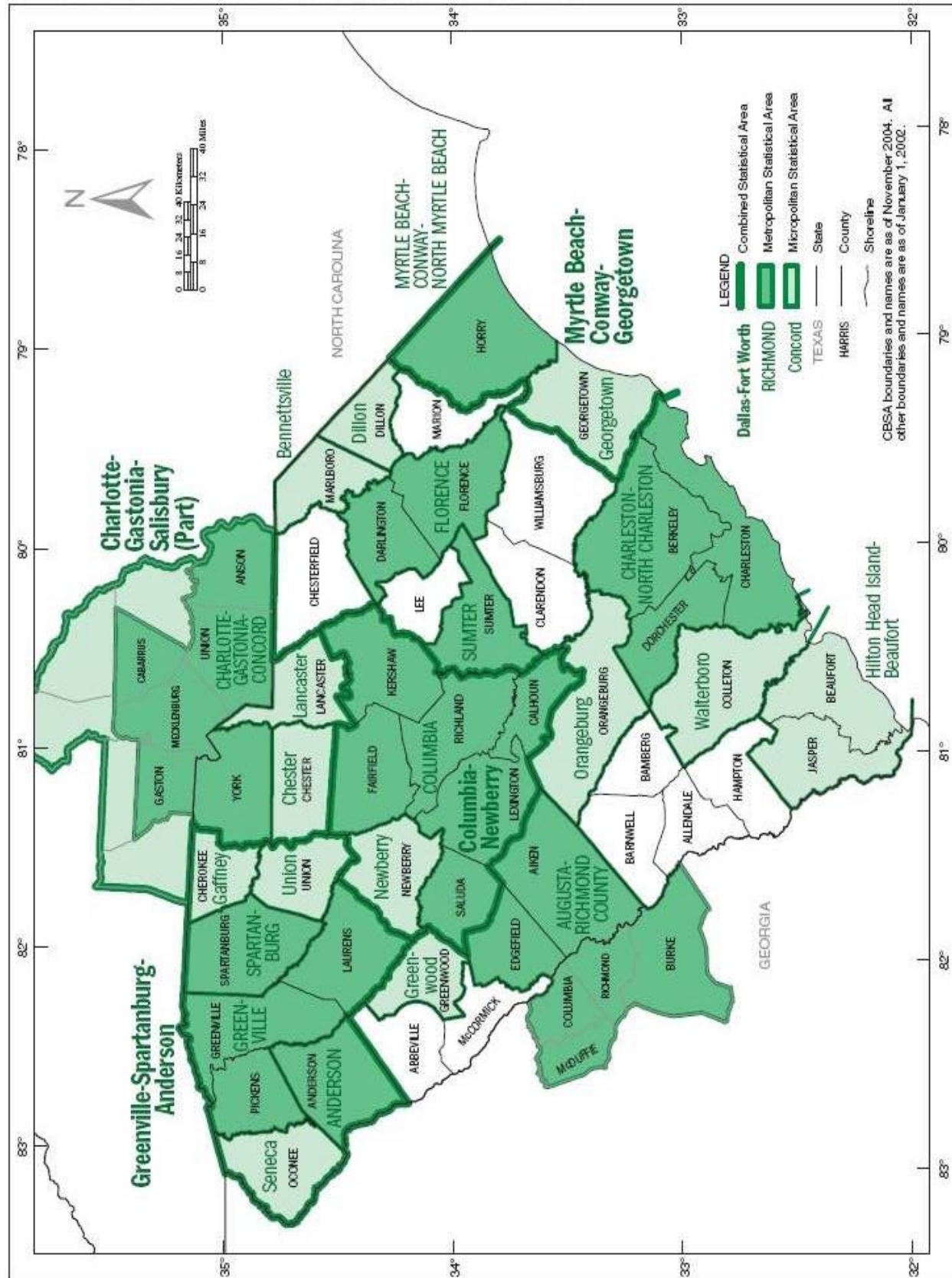
### *Changes for 2009*

Any planned changes in parameters monitored, the configuration or operations at the site planned for 2009 are described herein and summarized in the Summary of 2009 Network Changes. Unless otherwise indicated changes at a site, including the beginning of new monitoring activity, will be effective January 1, 2009. Ozone monitoring for 2009 at new or special project sites may start at the beginning of the ozone monitoring season (April-October).

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<sup>4</sup> <http://www.epa.gov/ttn/amtic/calendar.html>

# SOUTH CAROLINA - Core Based Statistical Areas and Counties



## Network Summaries

2009 Air Monitoring Stations																		
Region	Sites	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP/Lead	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOC
Greenville-Spartanburg-Anderson CSA	11	7	5	1	1	0	5	2	1	1	1	1	0	0	0	1	2	0
Columbia CSA	9	4	1	0	4	0	3	2	1	0	1	1	2	3	2	1	4	0
Charlotte-Gastonia-Salisbury CSA	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Myrtle Beach-Conway-Georgetown CSA	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0
Augusta-Richmond County MSA	4	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Charleston-North Charleston MSA	5	3	2	2	1	0	2	2	2	1	0	1	0	0	0	0	1	0
Florence MSA	3	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Rest of State	3	1	2	1	2	0	3	0	0	0	0	1	1	1	0	1	2	1
TOTALS	39	19	12	4	11	0	18	6	4	2	2	4	3	4	2	3	12	1

This summary table presents the proposed elements of the South Carolina Ambient Air Monitoring Network after realignment of the monitors as proposed in this plan.



**PM<sub>2.5</sub> Samplers Suitable for comparison to the PM<sub>2.5</sub> National Ambient Air Quality Standards**

Sites using Federal Reference Method	Site suitable for comparison to annual standard?	Site suitable for comparison to the 24-Hour standard?	Site Description Page number
Greenville CHD	Yes	Yes	13
Greenville ESC	Yes	Yes	16
Taylor's	Yes	Yes	15
West View	Yes	Yes	19
Long Creek	Yes	Yes	17
Chesterfield	Yes	Yes	60
Sneed	Yes	Yes	56
FAA	Yes	Yes	52
CPW	Yes	Yes	53
Parklane	Yes	Yes	31
Irmo	Yes	Yes	26
Bates House	Yes	Yes	32
Sandhill	Yes	Yes	33
Aiken Particulate Study	TBD*	TBD*	46
T.K. Greg Recreation Ctr.	TBD*	Yes*	22
Williams Middle School	TBD*	Yes*	57
* Sites without a significant data record but expected to be suitable for comparison to primary and secondary annual and 24-hour standards.			

**PM<sub>2.5</sub> and Ozone Design Values 2005 – 2007**

This section presents the latest ambient air quality data for currently operating monitoring sites throughout South Carolina. Only PM<sub>2.5</sub> and Ozone are presented below. All other Criteria Pollutant design values were well below the level of the standards in 2007.

<b>PM<sub>2.5</sub> Design Values 2005 – 2007</b>			
Site ID	Site Name	Annual (µg/m <sup>3</sup> )	Daily (µg/m <sup>3</sup> )
45-037-0001	Trenton	13.1	30
45-073-0001	Longcreek	11.2	29
45-045-0008	Greenville Health Dept	15.3	31
45-045-0009	Taylors	14.7	32
45-083-0010	West View Elementary School	14.2	32
45-063-0008	Irmo	14.6	32
45-079-0007	Parklane	13.7	30
45-079-0019	Bates House (USC)	14.2	32
45-025-0001	Chesterfield	12.4	28
45-041-0002	H L Sneed Middle School	12.6	29
45-019-0048	Charleston FAA Beacon	12.0	27
45-019-004	Charleston Public Works	11.2	25

<b>Ozone Design Values 2005 – 2007</b>		
Site ID	Site Name	Design Value (ppm)
45-001-0001	Due West	0.081
45-003-0003	Jackson	0.077
45-015-0002	Bushy Park	0.064
45-019-0046	Cape Romain	0.074
45-021-0002	Cowpens	0.073
45-025-0001	Chesterfield	0.075
45-029-0002	Ashton	0.074
45-031-0003	Pee Dee	0.076
45-037-0001	Trenton	0.070
45-073-0001	Long Creek	0.072
45-077-0002	Clemson CMS	0.081
45-079-0007	Parklane	0.080
45-079-0021	Congaree Bluff	0.073
45-079-1001	Sandhill	0.082
45-083-0009	NSFS	0.083
45-091-0006	York	0.079

## **Summary of 2009 Network Changes**

### **Anderson MSA**

Implementation of the 2008 Monitoring Plan is being continued.

### **Greenville MSA**

Implementation of the 2008 Monitoring Plan including comparison of Greenville CHD (45-045-0008) and ESC (45-045-0015) data is being continued.

Discontinue PM<sub>2.5</sub> and Ozone monitoring at Clemson CMS (45-077-0002).

Discontinue meteorological monitoring, TSP and PM<sub>10</sub> sampling at Greenville CHD (45-045-0008).

Discontinue meteorological monitoring at Taylors (45-045-0009).

### **Spartanburg MSA**

Implementation of the 2008 Monitoring Plan including comparison of Westview (45-083-0010) and T.K. Gregg (45-083-00xx) is being continued.

### **Charlotte-Gastonia-Concord MSA**

No changes planned for 2009.

### **Augusta-Richmond County MSA**

Implementation of the 2008 Monitoring Plan is being continued.

### **Columbia MSA**

Implementation of the 2008 Monitoring Plan is being continued.

Discontinue PM<sub>2.5</sub> sampling at Parklane (45-079-0018).

PM<sub>10</sub> monitoring scale of representativeness at Olympia (45-079-0007) has been revised from microscale to neighborhood to reflect changes in traffic patterns around the site and review of local PM<sub>10</sub> data.

### **Sumter MSA**

No changes planned for 2009.

### **Florence MSA**

Implementation of the 2008 Monitoring Plan including comparison of Sneed (45-041-0002) and Williams (45-041-00xx) is being continued.

### **Myrtle Beach-Conway-North Myrtle Beach MSA**

No changes planned for 2009.

### **Charleston-North Charleston MSA**

No changes planned for 2009.

### **Georgetown Micropolitan Statistical Area**

Implementation of the 2008 Monitoring Plan is being continued.

### **Remainder of State**

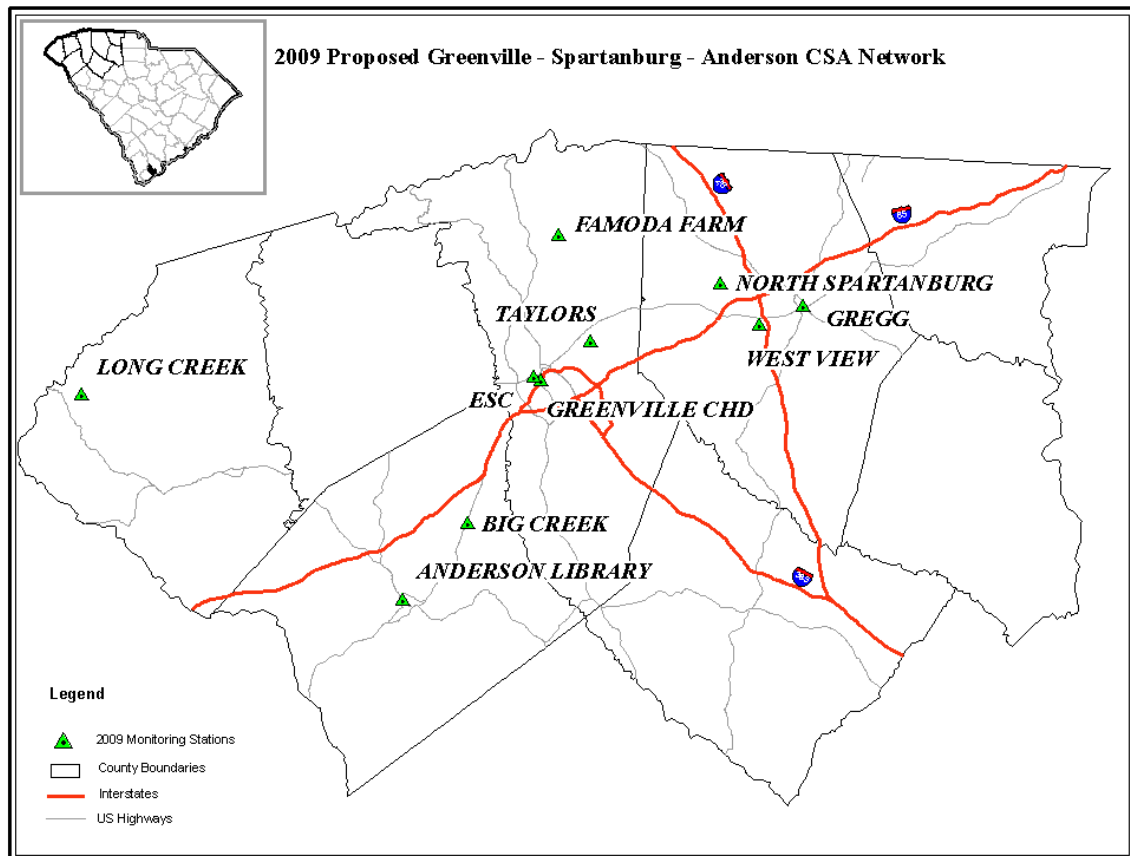
Implementation of the 2008 Monitoring Plan is being continued.

Discontinue Ozone monitoring at Cowpens (45-021-0002).

Discontinue TSP sampling at Chesterfield (45-025-0001).

## Site Descriptions

### Greenville-Spartanburg-Anderson CSA



	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-045-0008	Greenville County Health Department*	●	●	○					○	○	○	○						
45-045-0009	Taylors*	●●																
45-045-0015	Greenville ESC	○	○		●			○									○	
45-073-0001	Long Creek	●	○				○	○								○	○	
45-083-0009	North Spartanburg Fire Station #2						●											
45-083-0010	West View	●																
45-007-0004	Anderson Library		○															
45-007-0005	Big Creek						●											
45-083-xxxx	T.K. Gregg Recreational Center	○	●															
45-045-1003	Famoda Farms						●											
45-045-xxxx	Southeast Greenville County Ozone						●											
	TOTAL	7	5	1	1	0	5	2	1	1	1	1	0	0	0	1	2	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA samplers *see individual site description for site/parameter retention																		

## Greenville County Health Department

**Air Quality Control Region:** Greenville-Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville MSA

**AQS Site ID:** 45-045-0008

**Location:** 91 Wakefield Street, Greenville, SC, 29601

**County:** Greenville

**Coordinates:** +34.838814, -82.402918

**Date Established:** April 6, 1989

**Site Evaluation:** The most recent site evaluation was conducted on March 30, 2005.



This monitoring site is located on the grounds of the Greenville County Health Department. The Greenville County Health Department (CHD) site is located approximately 2 km (1 mile) south of downtown Greenville. The Greenville County Health Department site has samplers for PM<sub>2.5</sub> and TSP. This site also has continuous monitors for NO<sub>2</sub>, SO<sub>2</sub> and CO, Light Absorbing Carbon (LAC), sulfate, and PM<sub>2.5</sub>. The site supports the required collocated PM<sub>2.5</sub> continuous monitor for the MSA. Data from the continuous monitor cannot be used for comparison to the PM<sub>2.5</sub> NAAQS. The sample inlets are 23.2 meters from the nearest road. This site was one of three sites representing the

Greenville-Spartanburg Monitoring Planning Area for PM<sub>2.5</sub>.

The Department has established a new site (Greenville ESC) in the downtown Greenville area which better meets suggested PM<sub>2.5</sub> siting criteria. Once the data has been demonstrated to meet the monitoring objectives, the Department will relocate some or all of the monitoring activity to the more appropriate location.

The criteria pollutants NO<sub>2</sub> and CO will continue to be monitored at this location to provide fine particulate and ozone precursor data and data to support modeling. Facilities wishing to make modifications or build new plants are required to model for criteria pollutants and the Greenville data will provide a conservative estimate of ambient concentrations in the Upstate.

### Changes for 2009

The Department intends to eliminate meteorological monitoring, TSP and PM<sub>10</sub> sampling at this site.

This is a carry-over item from the 2008 Monitoring Plan. Within the next 12 months, the Department will have collected one years worth of concurrent data from the Greenville ESC site, and will evaluate and determine if relocation is appropriate.

Monitors:

(table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	4.0	FRM Gravimetric	1:1

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure/ General Background	SLAMS	4.5	TEOM-FDMS (includes measurement of volatile PM <sub>2.5</sub> )	Continuous
Speciated PM <sub>2.5</sub>	Neighborhood	Population Exposure	Supplementary speciation	4.5	STN Protocol	1:6
Nitrogen Dioxide	Neighborhood	Population Exposure/ Max Precursor Impact	SPM	4.0	FRM Chemiluminescence	Continuous
Carbon Monoxide	Middle	Max Precursor Impact	SPM	4.0	FRM Nondispersive Infrared Photometry	Continuous
Sulfate	Neighborhood	Population Exposure / General Background	Non-regulatory	4.5	Catalytic thermal reduct/Pulsed fluorescence	Continuous
Black Carbon	Neighborhood	Population Exposure / General Background	Non-regulatory	4.5	Optical absorption	Continuous

## Taylors

**Air Quality Control Region:** Greenville-Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA

**AQS Site ID:** 45-045-0009

**Location:** 405 Brushy Creek Road

**County:** Greenville

**Coordinates:** +34.899141, -82.313070

**Date Established:** May 1, 1999

**Site Evaluation:** The most recent site evaluation was conducted on April 7, 2005.



This monitoring site is in a residential area of the town of Taylors on the grounds of a city fire station. The site is approximately 6 kilometers northeast of the Greenville Health Department monitoring site. The Taylors site was originally established as the location of one of two PM<sub>2.5</sub> Core samplers representing the Greenville-Spartanburg Monitoring Planning Area. The Taylors site has a FRM PM<sub>2.5</sub> and a collocated PM<sub>2.5</sub> FRM used for determination of method precision. The sample inlets are 27.0 meters from the nearest road.

### Changes for 2009

The Department intends to eliminate meteorological monitoring at this site.

This is a carry-over item from the 2008 Monitoring Plan. The monitoring of CO, NO<sub>2</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and LAC established as part of the Greenville PM<sub>2.5</sub> special studies were discontinued at the end of 2007. The Department intends to relocate monitoring from this site to an improved monitoring location in the Greenville urbanized area within the next 18 months. Monitoring at Taylors will be discontinued when the procedures for relocating a site have been completed.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	4.4	FRM Gravimetric	1:1
Collocated PM <sub>2.5</sub>	Neighborhood	Population Exposure	QA Collocated	4.4	FRM Gravimetric	1:6



**Greenville Employment Security Commission (ESC)****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville MSA**AQS Site ID:** 45-045-0015**Location:** 101 Perry Avenue**County:** Greenville**Coordinates:** +34.853985, -82.412754**Date Established:** April 11, 2008**Site Evaluation:** n/a

With the cooperation of local government and stakeholders, the Department established an additional site in the downtown Greenville area. Once the data has been demonstrated to meet the monitoring objectives, the Department will recommend to EPA relocation of some or all of the monitoring activity from Greenville CHD.

The site was established as a PM<sub>2.5</sub> population exposure / welfare related impacts sampler on 4/11/2008. The sample inlets are 15.0 meters from the nearest road.

**Changes for 2009**

The Department intends to complete the implementation of winds speed and direction monitoring at this site.

**Monitors:**

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure / Welfare Related Impacts	SPM	4.4	FRM Gravimetric	1:1
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SPM	4.0	TEOM	Continuous
PM <sub>10</sub>	Neighborhood	Population Exposure	SLAMS	4.0	FEM TEOM	Continuous
Sulfur Dioxide	Neighborhood	Population Exposure	SPM	4.0	FEM UV fluorescence	Continuous
Wind Speed / Direction		Local Conditions		10	Instruments for wind speed and wind direction	Continuous

## Long Creek

**Air Quality Control Region:** Greenville-Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA

**AQS Site ID:** 45-073-0001

**Location:** Round Mt. Fire Tower

**County:** Oconee

**Coordinates:** +34.805261, -83.237700

**Date Established:** August 1, 1983

**Site Evaluation:** The most recent site evaluation was conducted on February 18, 2005.



The Long Creek monitoring site is located on Round Mountain in northwest Oconee County. The Long Creek site was established as part of the Southern Oxidant Study. It provides a unique vantage for monitoring the impacts of transported pollutants. Long Creek has samplers for PM<sub>2.5</sub> and acid rain and has continuous monitors for O<sub>3</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and precipitation. The sample inlets are 11.0 meters from the nearest road.

Due to the importance of measuring region-wide SO<sub>2</sub>, PM<sub>2.5</sub> and ozone concentrations, the unique location and collocated monitoring activity, the Department has determined that current monitoring at this site should be continued.

### Changes for 2009

The Department intends to work with the land-owner to improve site exposure due to recent tree growth around the site.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Urban	General / Background	SLAMS	2.6	FRM Gravimetric	1:3
PM <sub>2.5</sub>	Urban	General / Background	SPM	4.3	TEOM 50°C	Continuous
Ozone	Regional	General / Background	SPM	4.3	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Regional	Regional Transport	SPM	4.3	FEM UV fluorescence	Continuous
Acid Rain	Neighborhood	Trends	SPM	1.5	IC	1 week samples Tue-Tue
Precipitation	Neighborhood	Local Conditions	Non-regulatory	1.5	Tipping bucket	Continuous

**North Spartanburg Fire Station #2****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA**AQS Site ID:** 45-083-0009**Location:** 1556 John Dodd Road**County:** Spartanburg**Coordinates:** +34.988706, -82.075802**Date Established:** April 4, 1990**Site Evaluation:** The most recent site evaluation was conducted on June 8, 2006.

This monitoring site is located in rural Spartanburg County, northwest of the city of Spartanburg. This site was established as a maximum ozone concentration monitor for the Greenville-Spartanburg-Anderson urban area on 04/04/1990. This monitor is designated SLAMS and fulfills the requirement for a maximum concentration site for the Spartanburg MSA.

The sample inlets are 85.0 meters from the nearest road.

**Changes for 2009**

This is a carry-over item from the 2008 Monitoring Plan. No changes are planned in the monitoring. Improvements to the immediate area around the site will be pursued to maintain exposure and security.

**Monitors:**

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.6	FEM Ultraviolet Photometry	Continuous

## West View

**Air Quality Control Region:** Greenville-Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA

**AQS Site ID:** 45-083-0010

**Location:** 4198 Copper Line Road

**County:** Spartanburg

**Coordinates:** +34.926839, -82.005211

**Date Established:** November 10, 1998

**Site Evaluation:** The most recent site evaluation was conducted on March 29, 2006.



The West View site is located in Spartanburg County at the West View Elementary School, west of the City of Spartanburg. The site was established as a PM<sub>2.5</sub> population exposure sampler on 11/10/1998 and one of the two Core samplers placed to represent the Greenville-Spartanburg Monitoring Planning Area.

The sample inlets are 99.0 meters from the nearest road.

Redefinition of MSA boundaries, the requirement for a maximum exposure/population oriented site and requirement for collocation of continuous monitoring for reporting to the public necessitate relocation of this monitor.

### Changes for 2009

This is a carry-over item from the 2008 Monitoring Plan. A new monitoring site appropriate for the MSA objectives and monitoring requirements has been established in Spartanburg County at the T.K. Gregg site. If the data meets the monitoring objectives, the Department will recommend to EPA relocation of all of the monitoring activity to the more appropriate location.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighbor-hood	Population Exposure	SLAMS	2.6	FRM Gravimetric	1:1

**Anderson Library****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Anderson MSA**AQS Site ID:** 045-007-0004**Location:** Anderson County Library**County:** Anderson**Coordinates:** 34.506, -82.648**Date Established:** July, 2008**Site Evaluation:** n/a

No picture available.

While there are no minimum requirements for PM<sub>2.5</sub> monitoring in the Anderson MSA, the Department will operate a continuous PM<sub>2.5</sub> monitor in the City of Anderson. With the cooperation of local government and stakeholders, the Department has established a new site in the City of Anderson to better understand the spatial distribution of PM<sub>2.5</sub> in the Upstate.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SPM	2.0	TEOM	Continuous

**Big Creek****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA/ Anderson MSA**AQS Site ID:** 45-007-0005**Location:** West of Williamston**County:** Anderson**Coordinates:** 34.623, -82.532**Date Established:** June 20, 2008**Site Evaluation:** n/a

No picture available.

With the cooperation of local government and stakeholders, the Department has established a new site to satisfy the minimum requirements for ozone monitoring in the Anderson MSA. This site has been established northeast of the City of Anderson to in the area expected to have the maximum ozone concentrations for the MSA.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration / Upwind Background	SLAMS	4.0	FEM Ultraviolet Photometry	Continuous

**T.K. Gregg Recreation Center****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Spartanburg MSA**AQS Site ID:** 45-083-XXXX**Location:** T. K. Gregg Recreation Center**County:** Spartanburg**Coordinates:** 34.996, -81.925**Date Established:** Summer 2008**Site Evaluation:** n/a

No picture available.

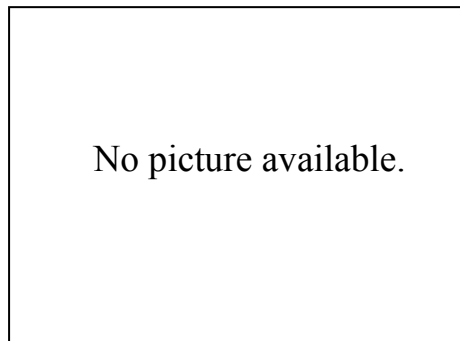
With the cooperation of local government and stakeholders, the Department is seeking to establish a new PM<sub>2.5</sub> site in the downtown Spartanburg area to meet the 40 CFR Part 58 Appendix D requirements for objective and collocated continuous monitoring and reporting. T.K. Gregg will be operated concurrently with the Westview site. If the data meets the monitoring objectives, the Department will recommend to EPA relocation of all of the monitoring activity to the more appropriate location.

Changes for 2009

This is a carry-over item from the 2008 Monitoring Plan. The site will be operational in 2008.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Highest Concentration	SPM		FRM Gravimetric	1:1
PM <sub>2.5</sub>	Neighborhood	Highest Concentration	SLAMS		TEOM	Continuous

**Famoda Farms****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville MSA**AQS Site ID:** 45-045-1003**Location:** Tigerville**County:** Greenville**Coordinates:** 34.051, -82.373**Date Established:** July, 2008**Site Evaluation:** n/a

This site will serve as one of the two required ozone monitors in the Greenville MSA. It is expected that this site will represent the maximum ozone concentration for the Greenville MSA.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS		FEM Ultraviolet Photometry	Continuous



**Southeast Greenville County****Air Quality Control Region:** Greenville-Spartanburg (202)**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville MSA**AQS Site ID:** 45-045-xxxx**Location:** To be determined**County:** Greenville**Coordinates:** n/a**Date Established:** Summer 2008**Site Evaluation:** n/a

No picture available.

This site will serve as one of the two required ozone monitors in the Greenville MSA. It is expected that this site will represent the population exposure in a growing area of the MSA in the Simpsonville area.

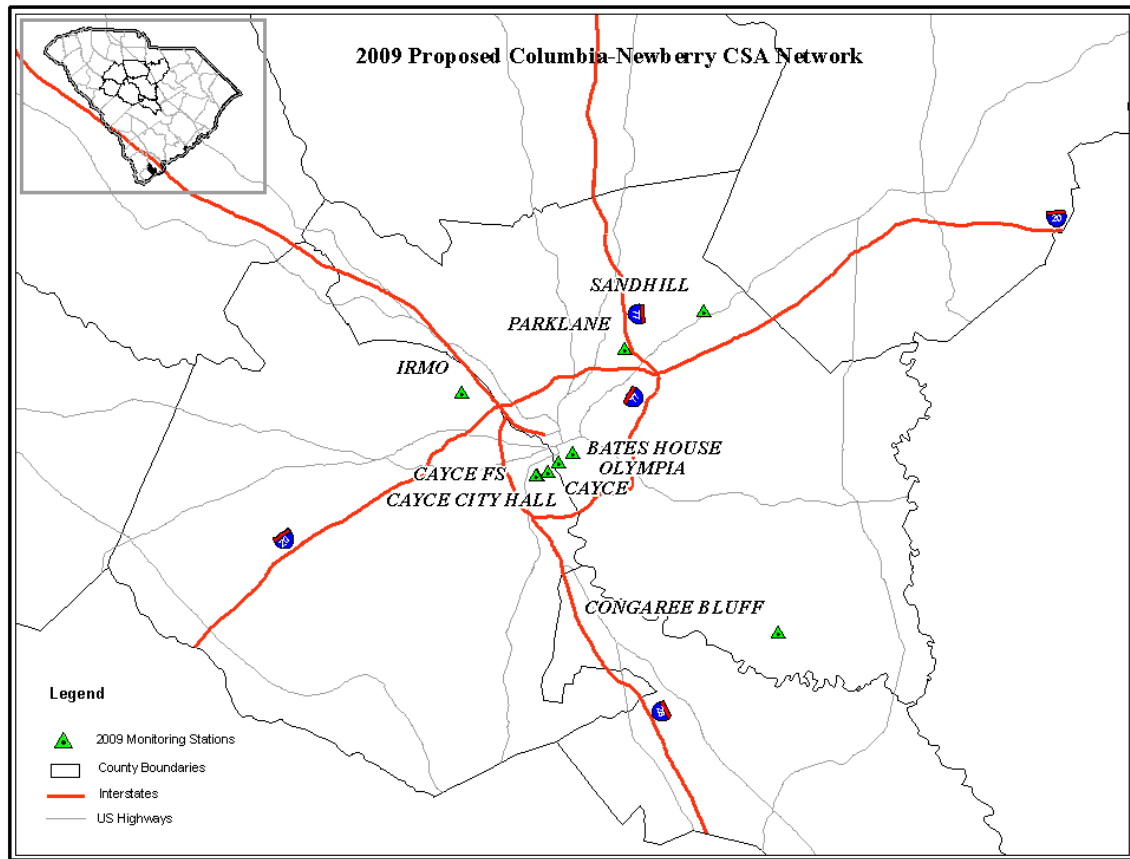
Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Population Exposure	SLAMS		FEM Ultraviolet Photometry	Continuous

## Columbia-Newberry CSA



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOC
45-063-0008	Irmo	●	●					○			○	○	○	○				
45-063-0009	Cayce CMS				○												○	
45-063-0010	Cayce City Hall				●													
45-079-0007	Parklane						●							○			○	
45-079-0018	Olympia				○													
45-079-0019	Bates House (USC)	●●			●													
45-079-0020	State Hospital												○	○				
45-079-0021	Congaree Bluff						○	○							○○	○	○	
45-079-1001	Sandhill	○					●		○								○	
	TOTAL	4	1	0	4	0	3	2	1	0	1	1	2	3	2	1	4	0
○ SPM / Other      ●● indicates duplicate QA samplers ● SLAMS																		

## Irmo

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-063-0008

**Location:** 200 Leisure Lane

**County:** Lexington

**Coordinates:** +34.051017, -81.154950

**Date Established:** April 7, 1989

**Site Evaluation:** The most recent site evaluation was conducted on February 25, 2005.



This site is located in Lexington County in the town of Irmo. The Irmo site has a sampler for PM<sub>2.5</sub>, and continuous monitors for SO<sub>2</sub>, sulfate, black carbon and PM<sub>2.5</sub>. Additionally, this site has a sampler collecting carbonyl samples on a 1:6 schedule. The sample inlets are 43.4 meters from the nearest road. The Irmo site supports the required collocated PM<sub>2.5</sub> continuous monitor for the MSA. Data from the continuous monitor cannot be used for comparison to the PM<sub>2.5</sub> NAAQS.

### Changes for 2009

This is a carry-over item from the 2008 Monitoring Plan. The Department requested an EPA on-site review (conducted in February 2008) which confirmed the site met all requirements of 40 CFR §58, Appendix E. The Department intends to explore alternative site locations and confirm the representative scale of monitoring in the area.

Monitors:

(table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	5.0	FRM Gravimetric	1:1
Continuous PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	4.6	TEOM 30°C	Continuous
SO <sub>2</sub>	Neighborhood	Source Oriented	SPM	3.4	FEM UV fluorescence	Continuous
Sulfate	Neighborhood	Population Exposure / General Background	Non-regulatory	5.1	Catalytic thermal reduction / Pulsed fluorescence	Continuous
Black Carbon	Neighborhood	Population Exposure / General Background	Non-regulatory	4.0	Optical absorption	Continuous

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Carbonyls	Neighborhood	Population Exposure	Non-regulatory	3.9	HPLC Ultraviolet Absorption	1:6
SVOC	Neighborhood	Population Exposure	Non-regulatory	3.9	PUF/GCMS	1:6

## Cayce CMS

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-063-0009

**Location:** 609 Frink Street

**County:** Lexington

**Coordinates:** +33.973389, -81.052675

**Date Established:** October 26, 1991

**Site Evaluation:** The most recent site evaluation was conducted on May 8, 2006.



This site is located in Lexington County in the city of Cayce. The PM<sub>10</sub> is a Special Purpose Monitor located in an urban and center city. This site was established as a source oriented monitor in an area where there is a concentration of industrial particulate sources. Cayce CMS represents middle scale concentrations of PM<sub>10</sub> in an area dominated by point sources and dust reentrained by mobile sources. The sample inlets are 4.9 meters from the nearest road.

Particulate concentration at this site is influenced by multiple local industrial sources and experienced some of the highest daily average concentrations of PM<sub>10</sub> in the state in 2006. The data collected at this location is intended for use by the Department, local government and industry to enable quick response to the impacts of local activities to minimize emissions. While not representative of population exposure, the continued availability of the data is important to the efforts of the Department and local stakeholders to protect air quality in nearby communities.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Middle	Source Oriented	SPM	4.3	TEOM Gravimetric	Continuous
Wind Speed / Direction		Local Conditions	Non-regulatory	10	Instruments for wind speed and wind direction	Continuous

## Cayce City Hall

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-063-0010

**Location:** To Be Determined

**County:** Lexington

**Coordinates:** n/a

**Date Established:** December 6, 2007

**Site Evaluation:** n/a



This site is a replacement for the Cayce Fire Station site, changing the monitored parameter from TSP to PM<sub>10</sub> and changing the measurement method from a 1:6 frequency sampler to a continuous monitor.

This site was established as a population exposure monitor to support local investigations and scale delineation. Cayce City Hall is in an area dominated by area sources.

The sample inlet is 32.0 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Neighborhood	Population Exposure	SLAMS	2.4	TEOM	Continuous

## Olympia

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-079-0018

**Location:** Heyward Street and Williams Street

**County:** Richland

**Coordinates:** +33.982253, -81.040235

**Date Established:** October 10, 1991

**Site Evaluation:** The most recent site evaluation was conducted on February 3, 2006.



This site was scheduled to be discontinued in 2007 but has been retained to support an on going Columbia particulate matter study and in response to community interest.

This site was established as a source oriented monitor on 10/10/1991 to measure impacts on residential areas from traffic related to a nearby quarry. The sample inlet is 9.1 meters from the nearest road.

### Changes for 2009

The scale of the PM<sub>10</sub> monitor was changed from microscale to neighborhood scale as a result of a change in traffic patterns near the site and evaluation of area PM<sub>10</sub> data.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Neighborhood	Source Oriented	SPM	4.5	TEOM	Continuous

## Parklane

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-079-0007

**Location:** 8311 Parklane Rd.

**County:** Richland

**Coordinates:** +34.093959, -80.962304

**Date Established:** April 3, 1980

**Site Evaluation:** The most recent site evaluation was conducted on March 22, 2007.



The Parklane site is located in north central Richland County. The Parklane site has samplers for acid rain and has continuous monitoring for ozone and precipitation. Additionally, the site has a sampler for semi-volatile compounds. The sample inlets are 57.0 meters from the nearest road.

The site was originally placed to provide downwind, edge of the Columbia urban area population exposure measurements. The site also provides a facility for training and equipment evaluation convenient to the Columbia DHEC air laboratory.

### Changes for 2009

PM<sub>2.5</sub> sampling at this site will be discontinued.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Neighborhood	Max Ozone Concentration	SLAMS	4.4	FEM Ultraviolet Photometry	Continuous
SVOC	Neighborhood	Population Exposure	Non-regulatory	2.3	PUF-GC/MS	1:6
Precipitation		Local Conditions	Non-regulatory	1.5	Tipping Bucket	Continuous



**Bates House (USC)****Air Quality Control Region:** Columbia (200)**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA**AQS Site ID:** 45-079-0019**Location:** 323 S. Bull Street**County:** Richland**Coordinates:** +33.991509, -81.024141**Date Established:** November 24, 1998**Site Evaluation:** The most recent site evaluation was conducted on March 17, 2003.

The Bates House (USC) site is located in Richland County on the University of South Carolina (USC)-Columbia campus. The Bates House site has a sampler for  $PM_{2.5}$ . Additionally, this site has collocated precision sampling for  $PM_{2.5}$ . The sample inlets are 28.8 meters from the nearest road.

A continuous  $PM_{10}$  sampler was installed in late 2005 as an element of the USC Particulate Study adding more timely information to the public than was available from the SLAMS  $PM_{10}$  sampler. The continuous data was intended to provide more detailed information to establish baseline and

measurement of potential impacts of a new biomass facility. The continuous monitor has replaced the filter sampling as the SLAMS monitor. The site has collocated wind measurement equipment (3m) operated by the USC Geography Department.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighborhood	Population Exposure	SLAMS	2.3	FRM Gravimetric	1:1
Collocated $PM_{2.5}$	Neighborhood	Population Exposure	QA Collocated	2.3	Gravimetric	1:6
$PM_{10}$	Neighborhood	Population Exposure	SLAMS	3.1	TEOM	Continuous

## State Hospital

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-079-0020

**Location:** 2100 Bull Street

**County:** Richland

**Coordinates:** +34.015494, -81.034179

**Date Established:** January 7, 1999

**Site Evaluation:** The most recent site evaluation was conducted on February 9, 2006.



The State Hospital site is located in Columbia near the intersection of Elmwood Avenue and Bull Street on the grounds of the South Carolina State Hospital. State Hospital has samplers for carbonyls and semi-volatile organic compounds. The sample inlets are 10.0 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Carbonyls	Neighborhood	General / Background	Non-regulatory	3.9	HPLC Ultraviolet Absorption	1:6
SVOC	Neighborhood	General / Background	Non-regulatory	5.0	PUF-GC/MS	1:6

## Congaree Bluff

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-079-0021

**Location:** 1850 South Cedar Creek Road

**County:** Richland

**Coordinates:** +33.814680, -80.781135

**Date Established:** December 27, 1999

**Site Evaluation:** The most recent site evaluation was conducted on April 11, 2005.



The Congaree Bluff site is located in southern Richland County. The site is located in a rural setting within the boundaries of the Congaree National Park. The Congaree Bluff site has monitors for ozone, SO<sub>2</sub>, gaseous mercury and precipitation. Congaree Bluff also has samplers for mercury deposition and acid rain. The sample inlets are 191.7 meters from the nearest road.

The Congaree Bluff monitoring continues a data record begun in 1981 with the establishment of the Congaree Swamp site (45-079-1006). The original site was established in cooperation with the Department of the Interior and the support of the General

Assembly to provide long term monitoring in this unique area.

The national park service collects wind data on a collocated 30 meter wind tower.

Changes for 2009

There are no changes planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General / Background	SPM	4.4	FEM Ultraviolet Photometry	Continuous
SO <sub>2</sub>	Urban	General / Background	SPM	4.4	FEM UV Fluorescence	Continuous
Mercury (vapor)	Urban	Source Oriented	Non-regulatory	4.4	Cold Vapor Atomic Fluorescence	Continuous
Mercury Deposition	Urban	Source Oriented	NADP-MDN	1.5	MDN protocol	Weekly samples
Acid Rain	Regional	Regional Transport	Non-regulatory	1.5	IC	1 Week Tue-Tue
Precipitation	Neighborhood	Local Conditions	Non-regulatory	1.5	Tipping Bucket	Continuous

## Sandhill Experimental Station

**Air Quality Control Region:** Columbia (200)

**CSA/MSA:** Columbia-Newberry CSA / Columbia MSA

**AQS Site ID:** 45-079-1001

**Location:** 900 Clemson Road

**County:** Richland

**Coordinates:** +34.131262, -80.868318

**Date Established:** January 1, 1959

**Site Evaluation:** The most recent site evaluation was conducted on July 1, 2002.



The Sandhill Experimental Station site is located in northeastern Richland County, downwind from the Columbia metropolitan area. This monitor is a SLAMS site and is located in a rural setting to conduct background surveillance.

The sample inlets are 33.5 meters from the nearest road.

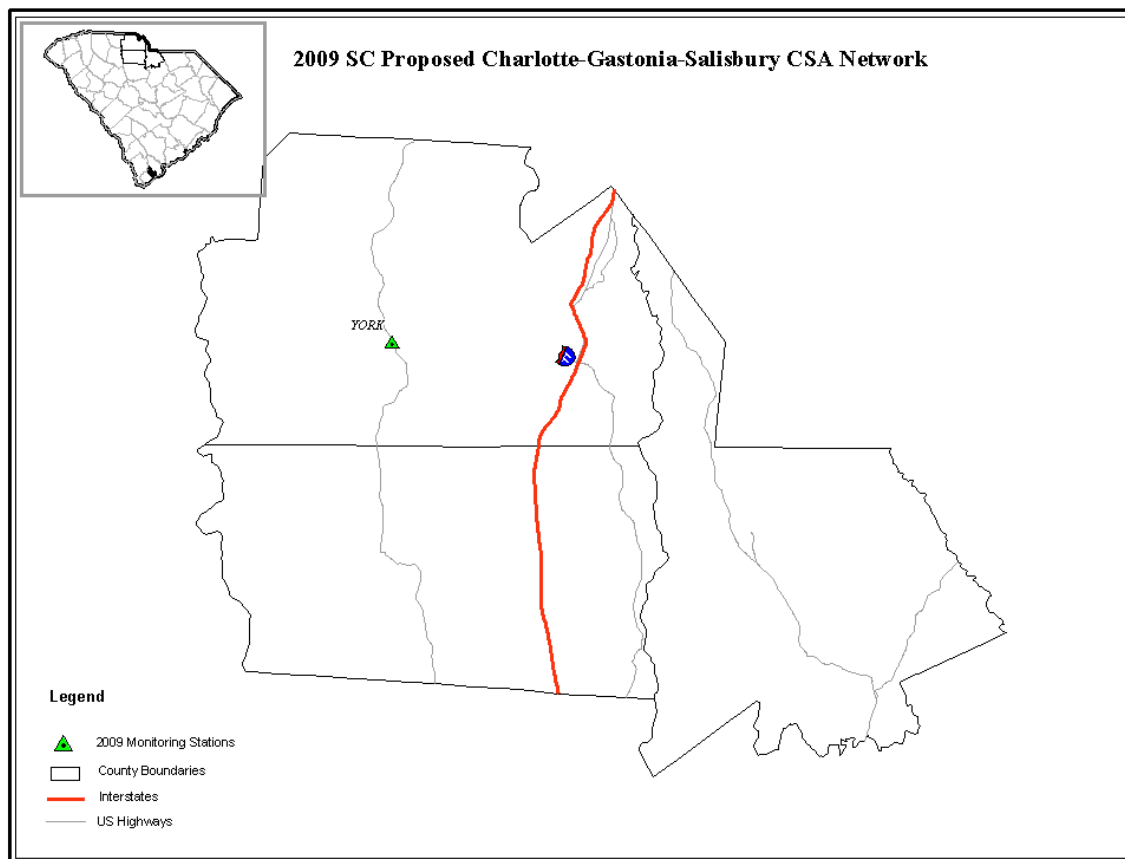
Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	General / Background	SPM	2.5	FRM Gravimetric	1:3
Ozone	Urban	Max Ozone Concentration	SLAMS	4.3	FEM Ultraviolet Photometry	Continuous
NO <sub>2</sub>	Urban	General / Background Max Precursor Emissions Impact	SPM	4.3	FRM Chemiluminescence	Continuous
Wind Speed / Direction	Neighborhood	Local Conditions	Non-regulatory	10.0	Instruments for wind speed and wind direction	Continuous

## Charlotte-Gastonia-Salisbury CSA (part)



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-021-0002	York CMS						O										O	
	TOTAL	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		

## York CMS

**Air Quality Control Region:** Metropolitan Charlotte (167)

**CSA/MSA:** Charlotte-Gastonia-Salisbury CSA / Charlotte-Gastonia-Concord MSA

**AQS Site ID:** 45-091-0006

**Location:** 2316 Chester Highway (US 321)

**County:** York

**Coordinates:** +34.935817, -81.228409

**Date Established:** March 30, 1993

**Site Evaluation:** The most recent site evaluation was conducted on June 13, 2006.



The York CMS site is located in south-central York County. The site was established to represent urban scales impacts near the Charlotte urban area. This monitor is located in a rural setting to support Charlotte-Rock Hill reporting and forecasting.

The sample inlets are 171.4 meters from the nearest road.

This site is important for forecasting ozone concentrations in the Charlotte Metropolitan area. Additionally, the long historical record and location of the site make the data useful to both North and South Carolina Air Programs.

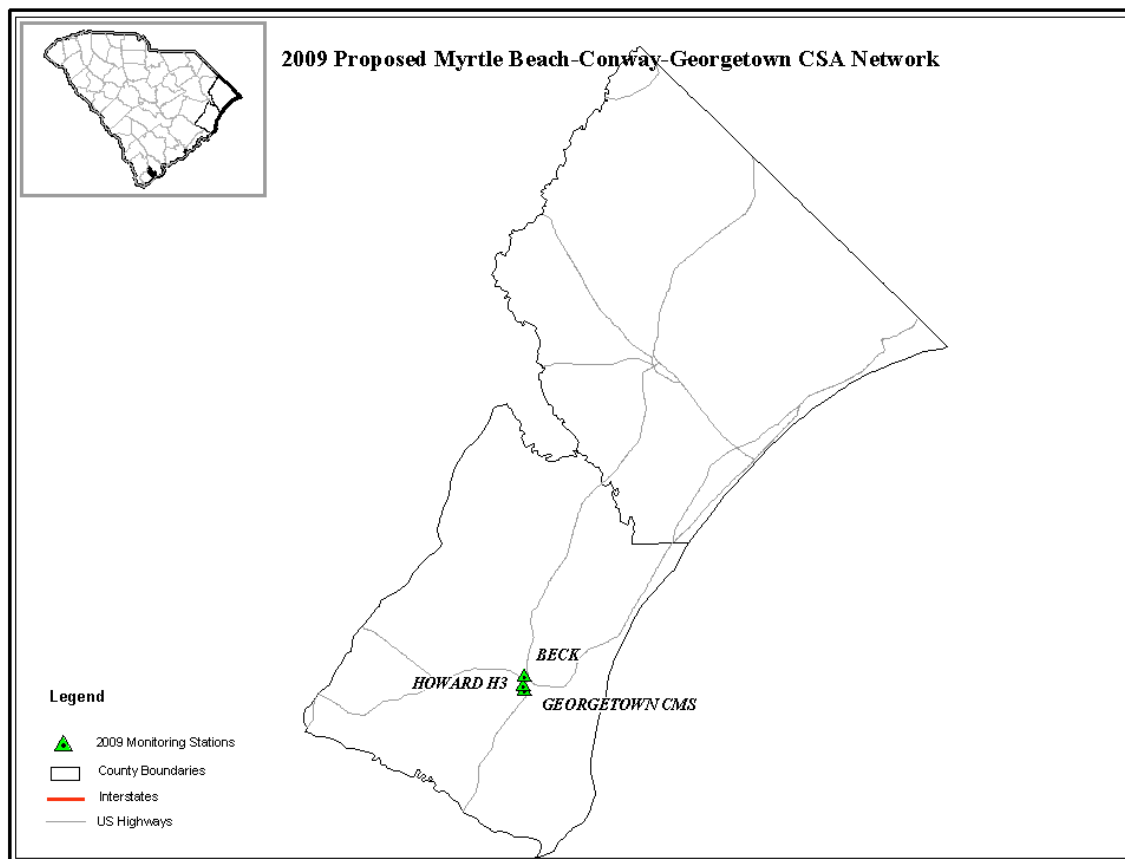
Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind Background	SPM	3.3	FEM Ultraviolet Photometry	Continuous
Wind Speed / Direction		Local Conditions	Non-regulatory	10.0	Instruments for wind speed, wind direction.	Continuous

## Myrtle Beach-Conway-Georgetown CSA



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-043-0006	Georgetown CMS				○												○○	
45-043-0011	Howard High School #3				○													
45-043-0012	Beck Administration				○													
	TOTAL	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		

## Georgetown CMS

**Air Quality Control Region:** Georgetown (204)

**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA

**AQS Site ID:** 45-043-0006

**Location:** 1369 Dock Street

**County:** Georgetown

**Coordinates:** +33.362014, -79.394251

**Date Established:** October 25, 1972

**Site Evaluation:** The most recent site evaluation was conducted on April 2, 2007.



The Georgetown CMS site is located in Georgetown County. Georgetown CMS is located in an industrial area dominated by point sources and is not intended to represent typical population exposures. The sample inlets are 21 meters from the nearest road.

As the site is located in very close proximity to several local sources (e.g., truck parking, material handling, and road dust), and not located near inhabited buildings or locations where the general public can be expected to be exposed to the concentration measured, its data is not appropriate for

comparison to the NAAQS. The Georgetown CMS site has continuous monitoring for meteorology and PM<sub>10</sub>.

Previous monitoring in the city residential areas at the Maryville, Howard High and Winyah sites have confirmed this location is representative of middle scale.

### Changes for 2009

This is a carry-over item from the 2008 Monitoring Plan. Consistent with original intended purpose of this monitor, alternative methods of continuous particulate monitoring are being investigated and evaluated for potential installation as a long term monitoring tool. When this alternative method is selected and installed, the continuous PM<sub>10</sub> monitor will be removed from this site. If an alternative method is not identified, the use of special purpose monitoring for particulates will be investigated to meet monitor needs related to local industrial sources in this limited area.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Middle	Source Oriented Highest Concentration	SPM	4.0	FEM TEOM	Continuous
Wind Speed/ Direction		Local Conditions	Non-regulatory	10.0	Instruments for wind speed and wind direction	Continuous
Precipitation		Local Conditions	Non-regulatory		Tipping Bucket	Continuous



**Howard High School #3****Air Quality Control Region:** Georgetown (204)**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA**AQS Site ID:** 45-043-0011**Location:** S. Kaminski Street**County:** Georgetown**Coordinates:** 33.369,-79.297**Date Established:** June, 2008**Site Evaluation:** n/a

No picture available.

This site is a replacement site for Howard High #2. Howard High School #3 is a repositioning of PM<sub>10</sub> monitoring in order to obtain better exposure. This site represents a continuation of monitoring in this area of Georgetown that has been ongoing since 1970 with the establishment of the original Howard High site.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Neighborhood	Population Exposure Highest Concentration	SPM	2.0	TEOM	Continuous

**Beck Administration Center****Air Quality Control Region:** Georgetown (204)**CSA/MSA:** Myrtle Beach-Conway-Georgetown CSA**AQS Site ID:** 45-043-0012**Location:** Georgetown**County:** Georgetown**Coordinates:** 33.383, -79.294**Date Established:** July, 2008**Site Evaluation:** n/a

No picture available.

The Beck Administration Center site is located in Georgetown County in the city of Georgetown. This site was established with cooperation from local stakeholders to represent background concentrations of PM<sub>10</sub> and provide context for other monitoring in the town of Georgetown. The Beck Administration Center will have continuous PM<sub>10</sub> monitoring.

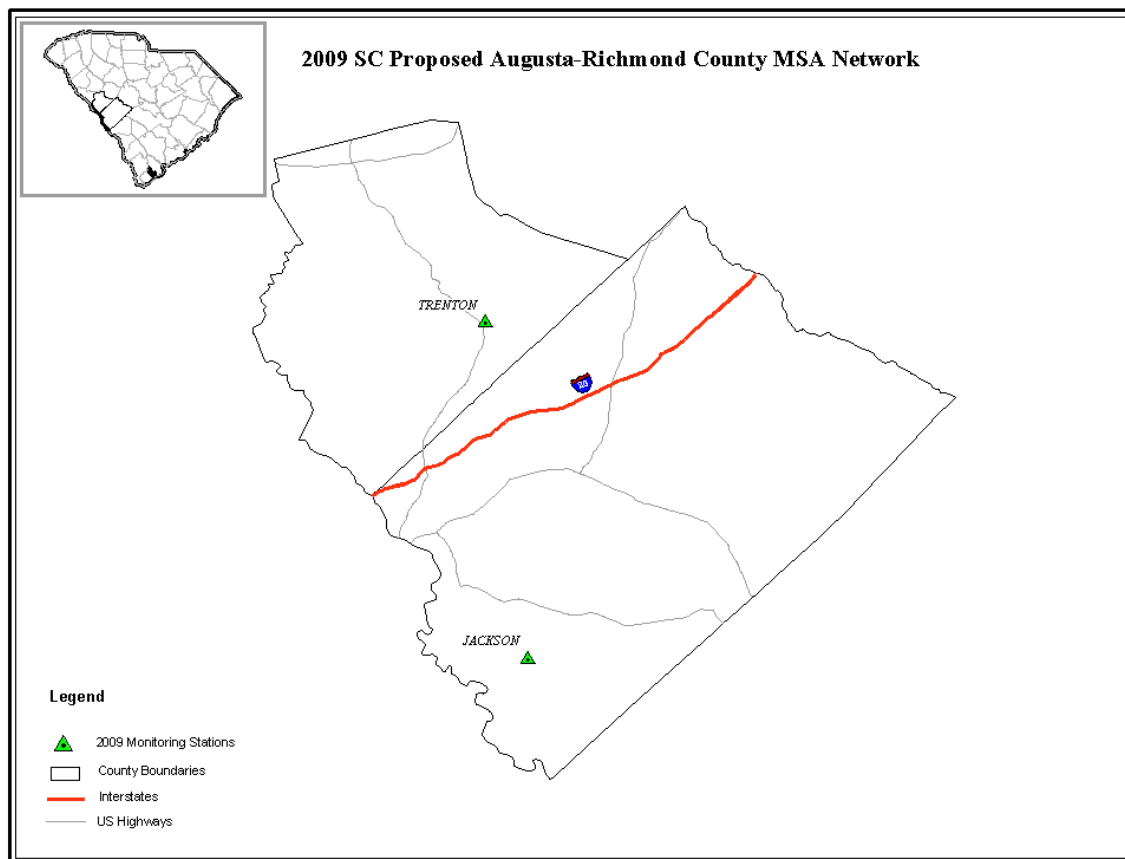
Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Neighborhood	Population Exposure	SPM	3.0	TEOM	Continuous

## Augusta-Richmond County MSA (part)



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-003-0003	Jackson Middle School						○											
45-037-0001	Trenton	○	○				●											
Not Available	North Aiken County						●											
Not Available	Aiken Particulate Study	○																
	TOTAL	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		

## **Jackson Middle School**

**Air Quality Control Region:** Augusta-Aiken (053)

**CSA/MSA:** Augusta-Richmond County MSA

**AQS Site ID:** 45-003-0003

**Location:** 8217 Atomic Road (Indian Drive – School)

**County:** Aiken

**Coordinates:** +33.342226, -81.788731

**Date Established:** October 24, 1985

**Site Evaluation:** The most recent site evaluation was conducted on June 14, 2006.



The Jackson Middle School site is located in southwestern Aiken County at the Jackson Middle School. Jackson is located in a suburban setting to monitor concentrations upwind of the Augusta urbanized area. The sample inlet is 138.8 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind Background	SPM	4.0	FEM Ultraviolet Photometry	Continuous

## Trenton

**Air Quality Control Region:** Augusta-Aiken (053)

**CSA/MSA:** Augusta-Richmond County MSA

**AQS Site ID:** 45-037-0001

**Location:** 660 Woodyard Road (Hwy 121)

**County:** Edgefield

**Coordinates:** +33.739963, -81.853635

**Date Established:** March 28, 1980

**Site Evaluation:** The most recent site evaluation was conducted on March 18, 2003.



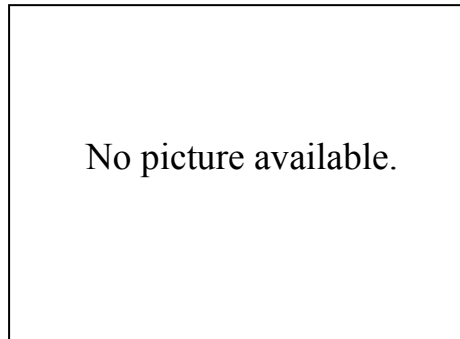
The Trenton site is located in southeastern Edgefield County. Trenton was originally placed as the Aiken/Augusta area downwind expected ozone maximum site. The Trenton site has both FRM and continuous monitoring for PM<sub>2.5</sub>. The sample inlets are 39.4 meters from the nearest road.

### Changes for 2009

This is a carry-over item from the 2008 Monitoring Plan. In order to better characterize ozone concentrations in the South Carolina portion of the MSA, the Department will establish a site closer to North Augusta in Aiken County. Monitoring at Trenton will be discontinued when the procedures for relocating monitors have been completed. The EPA is expected to release new monitoring requirements for ozone in 2008. The Department will delay implementation of changes for 2009 until these regulations are published and the impacts of changes assessed.

### Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Urban	Extreme Downwind	SPM	4.5	Gravimetric	1:3
Continuous PM <sub>2.5</sub>	Urban	Extreme Downwind	SPM	1.8	TEOM 50°C	Continuous
Ozone	Urban	Highest Concentration / Extreme Downwind	SLAMS	3.6	FEM Ultraviolet Photometry	Continuous

**North Aiken County****Air Quality Control Region:** Augusta-Aiken (053)**CSA/MSA:** Augusta-Richmond County MSA**AQS Site ID:** 45-003-xxxx**Location:** To Be Determined in northern Aiken County near North Augusta**County:** Aiken**Coordinates:** n/a**Date Established:** To be established in 2009**Site Evaluation:** n/a

This site is intended to be a replacement for the existing Trenton site.

**Changes for 2009**

This is a carry-over item from the 2008 Monitoring Plan. The EPA is expected to release new monitoring requirements for ozone in 2008. The Department will delay implementation of changes for 2009 until these regulations are published and the impacts of changes assessed.

**Monitors:**

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS		FEM Ultraviolet Photometry	Continuous

**Aiken Particulate Study****Air Quality Control Region:** Augusta-Aiken (053)**CSA/MSA:** Augusta-Richmond County MSA**AQS Site ID:** 45-003-xxxx**Location:** To Be Determined near North Augusta and Aiken**County:** Aiken**Coordinates:** n/a**Date Established:** 2009**Site Evaluation:** n/a

No picture available.

This special study will provide measurement and an opportunity for comparison of population oriented concentrations between the two Aiken county population centers and PM<sub>2.5</sub> concentrations measured in the adjacent city of Augusta, Georgia.

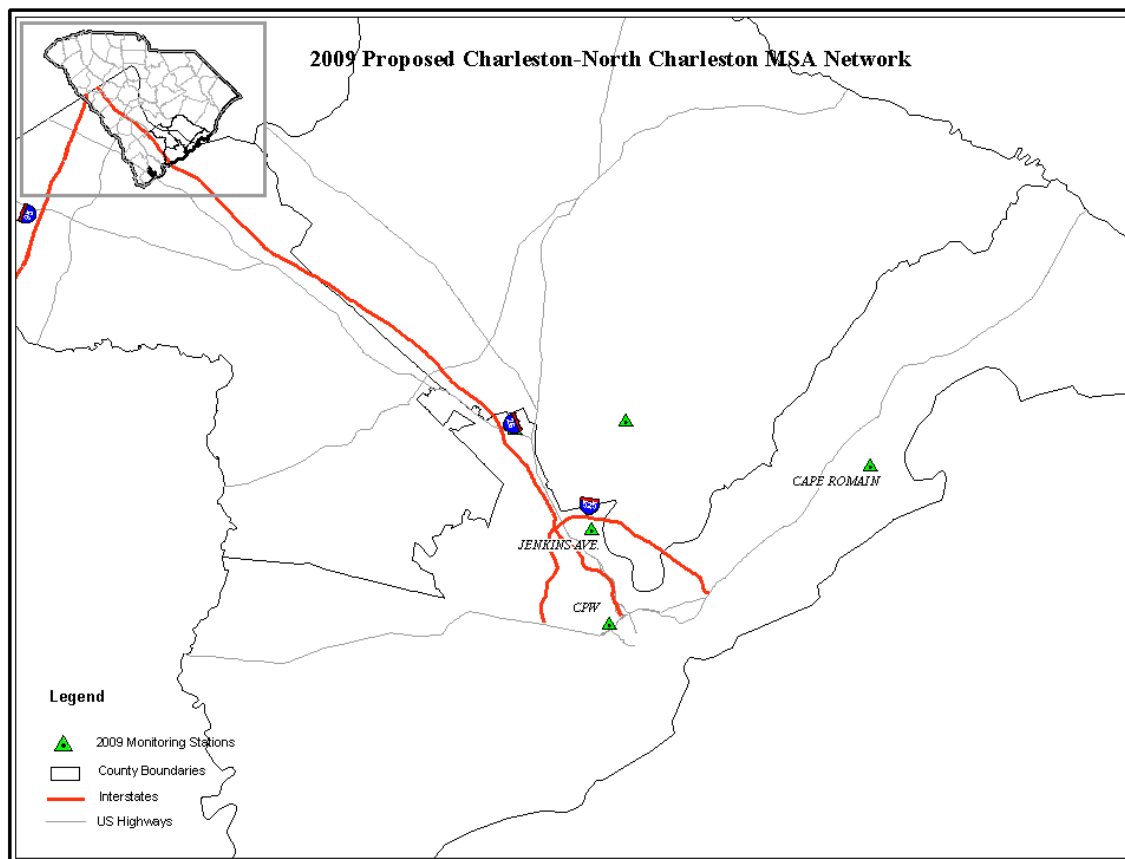
**Changes for 2009**

This is a carry-over item from the 2008 Monitoring Plan. Siting and installation of a suitable SPM site will be established in North Augusta to better understand the spatial distribution of PM<sub>2.5</sub> in the CSRA.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SPM		FRM Gravimetric or TEOM	1:3 or Continuous

## Charleston-North Charleston MSA



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-015-0002	Bushy Park Pump Station						●											
45-019-0003	Jenkins Ave. Fire Station				●			○	○									
45-019-0046	Cape Romain		○	○			●	○	○	○		○					○	
45-019-0048	FAA	○○																
45-019-0049	Charleston Public Works	●	●	○														
	TOTAL	3	2	2	1	0	2	2	2	1	0	1	0	0	0	0	1	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		



**Bushy Park Pump Station****Air Quality Control Region:** Charleston (199)**CSA/MSA:** Charleston-North Charleston MSA**AQS Site ID:** 45-015-0002**Location:** 1530 Bushy Park Road (Goose Creek)**County:** Berkeley**Coordinates:** +32.987252, -79.936700**Date Established:** June 20, 1978**Site Evaluation:** The most recent site evaluation was conducted on March 17, 2003.

The Bushy Park Pump Station site is located in southeastern Berkeley County downwind from the Charleston urban area. The sample inlets are 11.3 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.0	FEM Ultraviolet Photometry	Continuous

**Jenkins Ave. Fire Station****Air Quality Control Region:** Charleston (199)**CSA/MSA:** Charleston-North Charleston MSA**AQS Site ID:** 45-019-0003**Location:** 4830 Jenkins Ave.**County:** Charleston**Coordinates:** +32.882289, -79.977538**Date Established:** February 14, 1969**Site Evaluation:** The most recent site evaluation was conducted on March 2, 2005.

The Jenkins Ave. Fire Station site is located in the city of North Charleston. The site is located in an urban and center city setting to conduct source-oriented ambient surveillance. The Jenkins Ave. Fire Station site monitors PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>2</sub>. The sample inlets are 9.6 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>10</sub>	Neighborhood	Highest Concentration	SLAMS	4.3	FEM TEOM	Continuous
SO <sub>2</sub>	Neighborhood	Population Exposure	SPM	4.3	FEM UV Fluorescence	Continuous
NO <sub>2</sub>	Neighborhood	Highest Concentration Source Oriented	SPM	4.3	FRM Chemiluminescence	Continuous

## **Cape Romain**

**Air Quality Control Region:** Charleston (199)

**CSA/MSA:** Charleston-North Charleston MSA

**AQS Site ID:** 45-019-0046

**Location:** 390 Bulls Island Road (Awendaw)

**County:** Charleston

**Coordinates:** +32.941023, -79.657187

**Date Established:** July 11, 1983

**Site Evaluation:** The most recent site evaluation was conducted on June 6, 2003.

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The Cape Romain site is located in Charleston County at the Cape Romain National Wildlife Refuge (NWR) near Moores Landing.

The Cape Romain NWR is a Class I area about 20 miles northeast of Charleston. The majority of the Refuge area is offshore extending from Bull Island 20 miles to Cape Romain. The Refuge is bordered on the west by the Intracoastal Waterway. Inland are large tracts of forests with scattered residences. Several miles inland a primary coastal route, US Highway 17, parallels the coast, but there is little development

along the section of highway that is close to the Refuge.

The Cape Romain site has samplers for PM<sub>2.5</sub> speciation, and continuous monitors for CO, SO<sub>2</sub>, NO<sub>2</sub>, ozone, black carbon, meteorological parameters and PM<sub>2.5</sub>. The sample inlets are 18 meters from the nearest road.

The Cape Roman site is collocated with the Interagency Monitoring of Protected Visual Environments (IMPROVE) sampling site and nearby monitoring performed by other agencies includes precipitation chemistry and mercury deposition. The site has been used for multiple interagency and regional air monitoring projects.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Urban	General / Background	SPM	3.0	TEOM 30°C	Continuous
Ozone	Regional	General / Background	SLAMS	4.0	FEM Ultraviolet Photometry	Continuous
SO <sub>2</sub>	Regional	Source Oriented	SPM	4.0	FEM UV Fluorescence	Continuous
NO <sub>2</sub>	Regional	General / Background	SPM	4.0	FRM Chemiluminescence	Continuous
CO	Urban	General Background	SPM	4.0	FRM Nondispersive Infrared	Continuous
Black Carbon	Regional	General / Background	Non-regulatory	4.0	Optical absorption	Continuous
Speciated PM <sub>2.5</sub>	Urban	Visibility	IMPROVE	3.0	IMPROVE protocol	1:3
Wind Speed / Direction		Local Conditions	Non-regulatory	10.0	Instruments for wind speed, and direction and precipitation	Continuous

**FAA****Air Quality Control Region:** Charleston (199)**CSA/MSA:** Charleston-North Charleston MSA**AQS Site ID:** 45-019-0048**Location:** 2670 Elms Plantation Blvd**County:** Charleston**Coordinates:** +32.980254, -80.065010**Date Established:** April 9, 1999**Site Evaluation:** The most recent site evaluation was conducted on May 4, 2006.

The Charleston FAA Beacon site is located in Charleston County approximately five miles northwest of the Charleston International Airport, near Charleston Southern University. This site has collocated PM<sub>2.5</sub> samplers to allow determination of method precision. The sample inlets are 50 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SPM	2.3	FRM Gravimetric	1:1
Collocated PM <sub>2.5</sub>	Neighborhood	Population Exposure	QA Collocated	2.3	FRM Gravimetric	1:6

## Charleston Public Works

**Air Quality Control Region:** Charleston (199)

**CSA/MSA:** Charleston-North Charleston MSA

**AQS Site ID:** 45-019-0049

**Location:** 360 Fishburne Street

**County:** Charleston

**Coordinates:** +32.790984, -79.958694

**Date Established:** November 20, 1998

**Site Evaluation:** The most recent site evaluation was conducted on April 24, 2006.



The Charleston Public Works (CPW) site is located on the western side of the Charleston peninsula near downtown Charleston. In addition to the PM<sub>2.5</sub> sampler, CPW has a PM<sub>2.5</sub> speciation sampler that is the South Carolina station in the national Speciation Trends Network (STN). The CPW site supports the required collocated PM<sub>2.5</sub> continuous monitor for the MSA. Data from the continuous monitor cannot be used for comparison to the PM<sub>2.5</sub> NAAQS. The sample inlets are 28 meters from the nearest road.

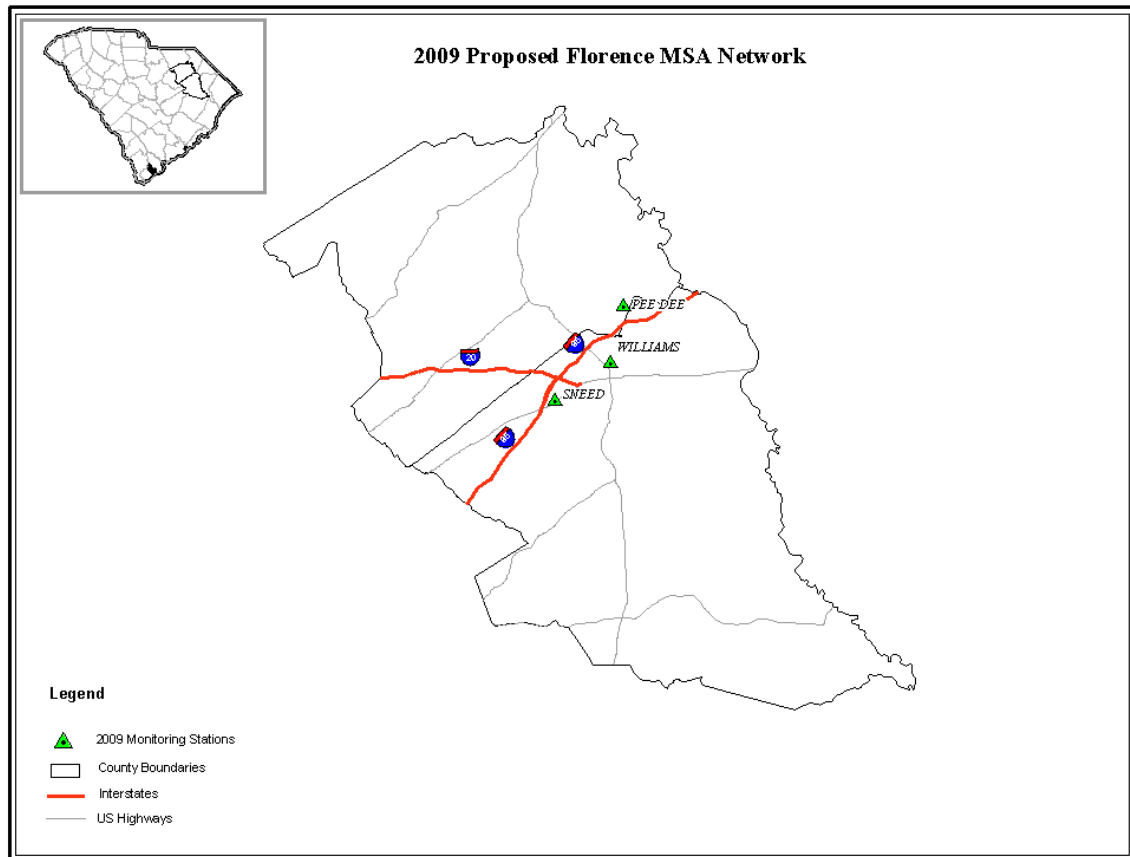
Changes for 2009

No changes are planned for 2009

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	2.4	Gravimetric	1:1
Speciated PM <sub>2.5</sub>	Neighborhood	Population Exposure	SPM	2.4	Energy dispersive XRF, Ion chromatography, STN TOT	1:3
PM <sub>2.5</sub>	Neighborhood	Population Exposure	SLAMS	3.0	TEOM	Continuous

## Florence MSA



AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-031-0003	Pee Dee Exp. Station						●											
45-041-0002	HL Sneed Middle School	●																
45-041-0003	Williams Middle School	○	○															
	TOTAL	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		

**Pee Dee Experimental Station****Air Quality Control Region:** Florence (201)**CSA/MSA:** Florence MSA**AQS Site ID:** 45-031-0003**Location:** 2200 Pocket Road (Darlington)**County:** Darlington**Coordinates:** +34.285696, -79.744859**Date Established:** February 25, 1993**Site Evaluation:** The most recent site evaluation was conducted on March 14, 2006.

The Pee Dee Experimental Station site is located in northeastern Darlington County. This site will serve as the required ozone monitor in the Florence MSA. The sample inlets are 91 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.0	FEM Ultraviolet Photometry	Continuous



**H L Sneed Middle School****Air Quality Control Region:** Florence (201)**CSA/MSA:** Florence MSA**AQS Site ID:** 45-041-0002**Location:** 3300 Thornblade Drive**County:** Florence**Coordinates:** +34.167636, -79.850404**Date Established:** January 15, 1999**Site Evaluation:** The most recent site evaluation was conducted on March 16, 2006.

The H L Sneed Middle School site is located in Florence County approximately 2 miles SSW of the I-20/I-95 interchange. The site was established to represent population exposure to  $PM_{2.5}$  concentrations on the neighborhood scale on 02/23/1999. The site is located on the edge of the Florence urban area. The sample inlets are 70 meters from the nearest road.

**Changes for 2009**

This is a carry-over item from the 2008 Monitoring Plan. In order to accommodate the required continuous  $PM_{2.5}$  monitoring for this MSA, a new monitoring site more appropriate for the objectives and monitoring requirements for  $PM_{2.5}$  has been established in Florence as a maximum population exposure site. The H L Sneed Middle School monitoring site will be discontinued when the procedures for relocating a monitor have been completed.

**Monitors:**

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighborhood	Population Exposure	SLAMS	2.5	FRM Gravimetric	1:3

**Williams Middle School****Air Quality Control Region:** Florence (201)**CSA/MSA:** Florence MSA**AQS Site ID:** 45-041-0003**Location:** 1119 N. Irby Street**County:** Florence**Coordinates:** 34.211, -79.442**Date Established:** July 2008**Site Evaluation:** n/a

No picture available.

The Florence MSA requires one PM<sub>2.5</sub> sampler in a population oriented area of expected maximum concentration. A collocated continuous monitor is also required to provide timely reporting of concentrations to the public.

The Department will establish a new site in a more densely populated area in Florence to meet the 40 CFR Part 58 Appendix D requirements for objective and collocated continuous monitoring and reporting. If the data meets the monitoring objectives, the Department will recommend to EPA discontinuing monitoring at the Sneed site.

Changes for 2009

No changes are planned for 2009

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Neighborhood	Population Exposure Highest Concentration	SPM		FRM Gravimetric	1:3
Continuous PM <sub>2.5</sub>	Neighborhood	Population Exposure Highest Concentration	SPM		TEOM	Continuous

## Remainder of State

AIRS ID	Site Name	PM <sub>2.5</sub>	PM <sub>2.5</sub> Cont.	Speciation	PM <sub>10</sub>	TSP	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Sulfate	BC	Carbonyls	SVOC	Mercury	Acid Rain	MET	VOCs
45-001-0001	Due West						○									○	○	
45-025-0001	Chesterfield	●	○	○	○○		○					○	○	○			○	○
45-029-0002	Ashton		○				○											
	TOTAL	1	2	1	2	0	3	0	0	0	0	1	1	1	0	1	2	1
○ SPM / Other ● SLAMS ●● indicates duplicate QA monitors																		

**Due West****Air Quality Control Region:** Greenwood (203)**CSA/MSA:** None**AQS Site ID:** 45-001-0001**Location:** 59 Jim Scott Lane**County:** Abbeville**Coordinates:** +34.325318, -82.386376**Date Established:** April 2, 1991**Site Evaluation:** The most recent site evaluation was conducted on June 27, 2006.

The Due West site is located in northeastern Abbeville County. In addition to monitoring for ozone, Due West has a monitor for precipitation and a sampler for acid precipitation.

The sample inlets are 76 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General / Background	SPM	4.0	FEM Ultraviolet Photometry	Continuous
Acid Rain	Neighborhood	Trends	Non-regulatory	1.5	IC	Weekly
Precipitation	Neighborhood	Local Conditions	Non-regulatory	1.5	Tipping bucket	Continuous

## Chesterfield

**Air Quality Control Region:** Florence (201)

**CSA/MSA:** None

**AQS Site ID:** 45-025-0001

**Location:** Rt 2 Box 100 McBee (SC145)

**County:** Chesterfield

**Coordinates:** +34.615367, -80.198787

**Date Established:** December 29, 1999

**Site Evaluation:** The most recent site evaluation was conducted on April 21, 2003.



The Chesterfield site is located in the central part of Chesterfield County. The Chesterfield site has continuous monitors for black carbon, PM<sub>2.5</sub>, ozone and meteorological parameters. Sampling is done for PM<sub>2.5</sub> and PM<sub>10</sub>. In addition to the STN protocol PM<sub>2.5</sub> speciation sampling, this site also is a precision site, with collocated FRM samplers for PM<sub>2.5</sub>, PM<sub>10</sub> and TSP. The sample inlets are 45 meters from the nearest road. The Chesterfield site is a Rural National Air Toxics Trends Site (NATTS), which includes carbonyl, VOC, SVOC and metal sampling.

### Changes for 2009

The Department intends to end sampling for TSP at this site.

Monitors:

(table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Regional	Regional Transport	SLAMS	3.0	FRM Gravimetric	1:3
Continuous PM <sub>2.5</sub>	Regional	Regional Transport	SPM	3.0	TEOM – 50° C	Continuous
Speciated PM <sub>2.5</sub>	Regional	Regional Transport	Supplementary speciation	3.0	Energy dispersive XRF, Ion chromatography, STN TOT	1:6
PM <sub>10</sub>	Regional	General / Background	SPM	3.0	Gravimetric ICP/MS	1:6
Collocated PM <sub>10</sub>	Regional	General / Background	QA Collocated	3.0	Gravimetric	1:6
Ozone	Regional	General / Background	SPM	2.0	FEM Ultraviolet Photometry	Continuous
Black	Regional	General /	Non-	4.5	Optical	Continuous

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Carbon		Background	regulatory		absorption	
Wind speed / direction		Local Conditions	Non-regulatory	10.0	Instruments for wind speed and direction	Continuous
Semi-volatiles	Regional	NATTS	Non-regulatory	3.0	PUF/GCMS	1:6
Volatile Organic Compounds	Regional	NATTS	Non-regulatory	3.0	Canister/GCMS	1:6
Carbonyls	Regional	NATTS	Non-regulatory	3.0	DNPH/IC	1:6

**Ashton****Air Quality Control Region:** Savannah-Beaufort (058)**CSA/MSA:** None**AQS Site ID:** 45-029-0002**Location:** Ashton Road (S-13-18)**County:** Colleton**Coordinates:** +33.007866 -80.965038**Date Established:** March 7, 1990**Site Evaluation:** The most recent site evaluation was conducted on April 18, 2005.

The Ashton site is located in northwestern Colleton County. The site was established as a general/background location on 03/07/1990. In addition to monitoring ozone, the Ashton site also monitors PM<sub>2.5</sub>. The sample inlets are 8 meters from the nearest road.

Changes for 2009

No changes are planned for 2009.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Continuous PM <sub>2.5</sub>	Regional	General / Background	SPM	4.0	TEOM 50°C	Continuous
Ozone	Urban	General / Background	SPM	4.0	FEM Ultraviolet Photometry	Continuous

**Monitors Discontinued for 2009**

Monitoring will be discontinued effective December 31, 2008.

Site	ID	Parameters	Date Established	
<b>Columbia MSA</b>				
Cowpens	45-021-0002	O <sub>3</sub>	March 25, 1988	Site realignment
Clemson CMS	45-077-0002	O <sub>3</sub>	July 14, 1979	Site realignment



## Cowpens

**Air Quality Control Region:** Greenville- Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA

**AQS Site ID:** 45-021-0002

**Location:** McGinnis Road (Old SC 110)

**County:** Cherokee

**Coordinates:** +35.130396, -81.816567

**Date Established:** March 25, 1988

**Site Evaluation:** The most recent site evaluation was conducted on June 26, 2006.



The Cowpens site is located in northwestern Cherokee County at the Cowpens National Battlefield. Cowpens is sited to represent ozone concentrations between the Greenville-Spartanburg-Anderson and the Charlotte-Gastonia-Salisbury CSAs. In addition to ozone, the Cowpens site also supports an acid precipitation sampler. The sample inlets are 23.0 meters from the nearest road.

The monitor will be operated through 2008 as part of the Greenville Ozone Study and to support ongoing plant damage research being conducted by the NPS Air Quality Division.

Continued operation of all sampling and monitoring at the Cowpens site beyond 2008 will be dependent on availability of additional resources and support.

Changes for 2009

This site will be discontinued at the end of 2008.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind / Background	SPM	3.0	FEM Ultraviolet Photometry	Continuous
Acid Rain	Regional	Regional Transport	SPM	1.5	IC	Weekly

### **Clemson CMS**

**Air Quality Control Region:** Greenville-Spartanburg (202)

**CSA/MSA:** Greenville-Spartanburg-Anderson CSA / Greenville MSA

**AQS Site ID:** 45-077-0002

**Location:** 106 Hope Well Road

**County:** Pickens

**Coordinates:** +34.653606, -82.838659

**Date Established:** July 14, 1979

**Site Evaluation:** The most recent site evaluation was conducted on March 18, 2003.



The Clemson Continuous Monitoring Site (CMS) site is located on the grounds of Clemson University near the western border of Pickens County. This monitor was intended to document ozone concentrations upwind of the Greenville-Spartanburg urbanized area.

The sample inlets are 27.4 meters from the nearest road.

Changes for 2009

This site will be discontinued at the end of the 2008 Ozone monitoring season.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM <sub>2.5</sub>	Urban	General Background	SPM	4.2	TEOM 50°C	Continuous
Ozone	Urban	General background	SPM	3.5	FEM Ultraviolet Photometry	Continuous